ICOM

SERVICE MANUAL

VHF FM TRANSCEIVERS

IC-F3GT
IC-F3GS

Icom Inc.

INTRODUCTION

This service manual describes the latest service information for the **IC-F3GT and IC-F3GS** at the time of publication.

To upgrade quality, all electrical or mechanical parts and internal circuits are subject to change without notice or obligation.

DANGER

NEVER connect the transceiver to an AC outlet or to a DC power supply that uses more than 16 V. Such a connection could cause a fire hazard and/or electric shock.

DO NOT expose the transceiver to rain, snow or any liquids.

DO NOT reverse the polarities of the power supply when connecting the transceiver.

DO NOT apply an RF signal of more than 20 dBm (100mW) to the antenna connector. This could damage the transceiver's front end.

ORDERING PARTS

Be sure to include the following four points when ordering replacement parts:

1. 10-digit order numbers
2. Component part number and name
3. Equipment model name and unit name
4. Quantity required

<**SAMPLE ORDER**>

0910051872	PCB B-5386B	IC-F3GT	MAIN UNIT	1 pieces
8810009510 Screw	BT M2 x 6 ZK	IC-F3GS	Chassis	10 pieces

Addresses are provided on the inside back cover for your convenience.



IC-F3GT IC-F3GS

REPAIR NOTES

1. Make sure a problem is internal before disassembling the transceiver.
2. **DO NOT** open the transceiver until the transceiver is disconnected from its power source.
3. **DO NOT** force any of the variable components. Turn them slowly and smoothly.
4. **DO NOT** short any circuits or electronic parts. An insulated turning tool **MUST** be used for all adjustments.
5. **DO NOT** keep power ON for a long time when the transceiver is defective.
6. **DO NOT** transmit power into a signal generator or a sweep generator.
7. **ALWAYS** connect a 40 dB to 50 dB attenuator between the transceiver and a deviation meter or spectrum analyzer when using such test equipment.
8. **READ** the instructions of test equipment thoroughly before connecting equipment to the transceiver.

TABLE OF CONTENTS

SECTION 1 SPECIFICATIONS

■ GENERAL

• Frequency coverage	: 136.000–150.000 MHz
• Type of emission	: 16K0F3E (W-type), 8K50F3E (N-type)
• Number of channels	: 32 ch (16 channels × 2 banks: 2-BANK version), 16 ch (16 channel version)
• Power supply requirement	: 7.2 V DC (negative ground; supplied battery pack)
• Current drain (approx.)	: Transmit at High (5.0 W) 1.6 A at Low (1.0 W) 700 mA Receive rated audio 250 mA stand-by 70 mA
• Frequency stability	: ±0.0005 %
• Usable temperature range	: –30˚C to +60˚C; –22˚F to +140˚F
• Dimensions (projections not included)	: 54(W) × 132(H) × 35(D) mm; 2 5⁄32(W) × 5 3⁄16(H) × 1 3⁄8(D) in.
• Weight (with ant., BP-209)	: 370 g; 13.1 oz.

■ TRANSMITTER

• RF output power (at 7.2 V DC) (with supplied battery pack)	: 5 W / 1 W (High / Low)
• Modulation system	: Variable reactance frequency modulation
• Maximum frequency deviation	: ±5.0 kHz (W-type), ±2.5 kHz (N-type)
• Spurious emissions	: 73 dBc typical
• Adjacent channel power	: 60 dB typical
• Transmitter audio distortion	: Less than 3% at 1 kHz, 40% deviation
• Limitting charact of modulator	: 70–100% of max. deviation
• Ext. microphone connector	: 3-conductor 2.5(d) mm (1⁄10")/2.2 kΩ

■ RECEIVER

• Receive system	: Double conversion superheterodyne system
• Intermediate frequencies	: 1st 31.05 MHz 2nd 450 kHz
• Sensitivity	: 0.25 µV at 12 dB SINAD (typical)
• Squelch sensitivity	: 0.25 µV at threshold (typical)
• Adjacent channel selectivity	: 65 dB (typical)
• Spurious response rejection	: 70 dB (typical)
• Intermodulation rejection ratio	: 70 dB (typical)
• Hum and noise	: 40 dB (typical)
• Audio output power (at 7.4 V DC)	: 500 mW typical at 5% distortion with an 8 Ω load
• Ext. speaker connector	: 3-conductor 3.5(d) mm (1⁄8")/8 Ω

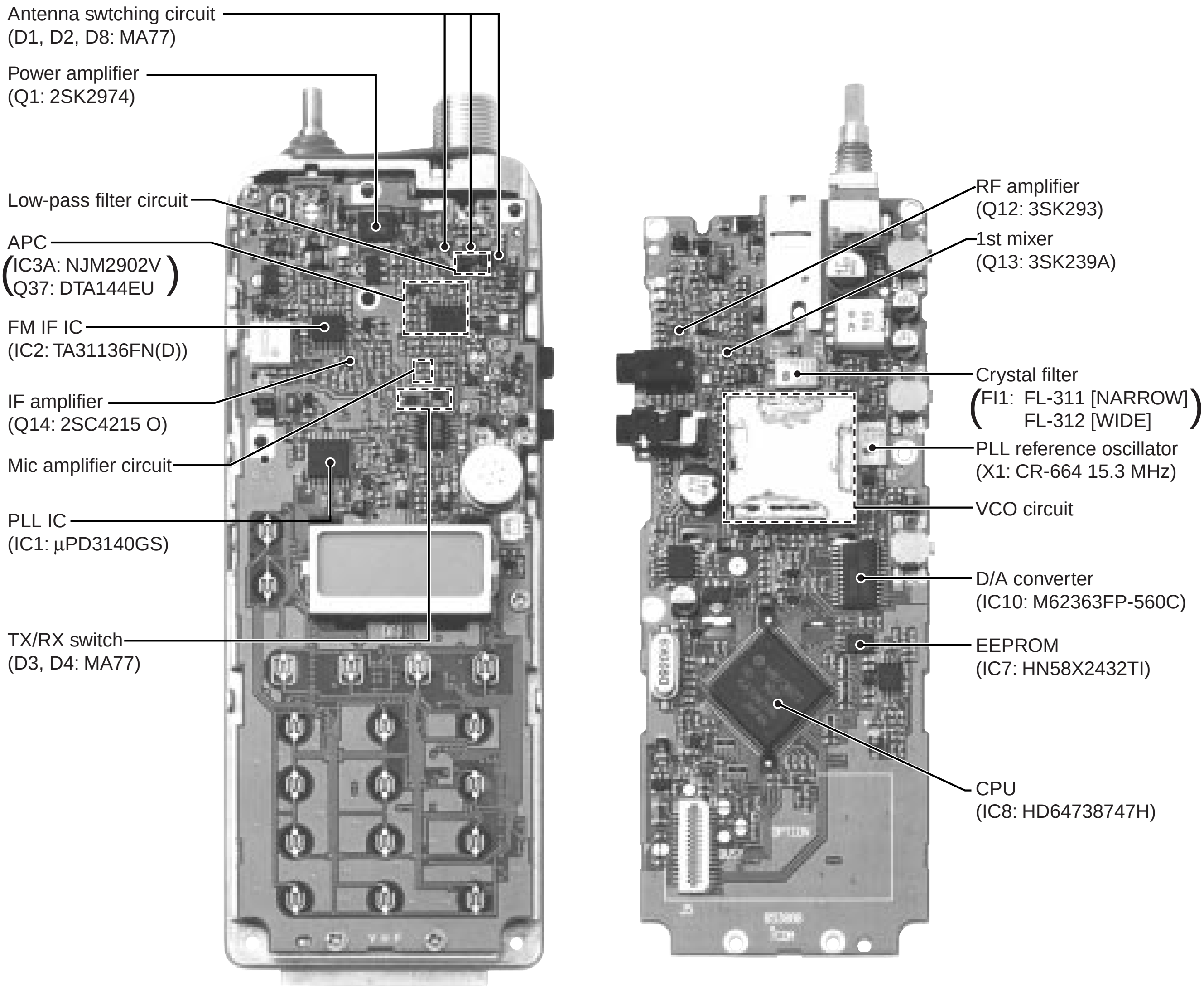
Specifications are measured in accordance with EIA/TIA-603.

All stated specifications are subject to change without notice or obligation.

SECTION 2 INSIDE VIEWS

• MAIN UNIT

TOP VIEW **BOTTOM VIEW**

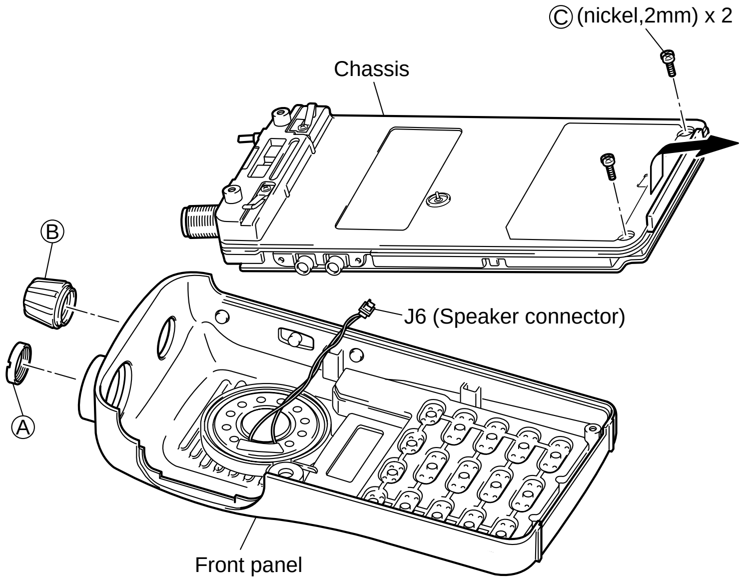


SECTION 3 DISASSEMBLY AND OPTION INSTRUCTIONS

3-1 DISASSEMBLY INSTRUCTION

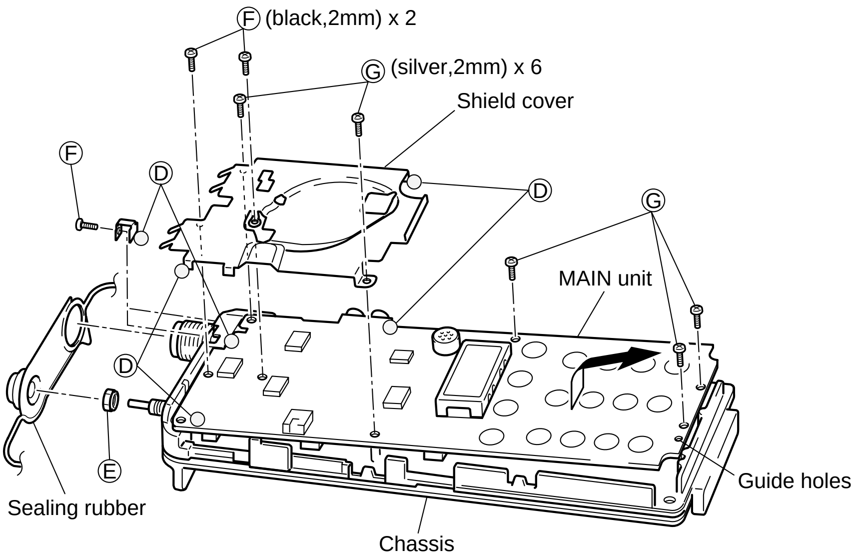
• REMOVING THE CHASSIS PANEL

① Unscrew 1 nut Ⓐ, and remove 1 knob Ⓑ.
② Unscrew 2 screws Ⓒ.
③ Take off the chassis in the direction of the arrow.
④ Unplug J6 to separate front panel and chassis.



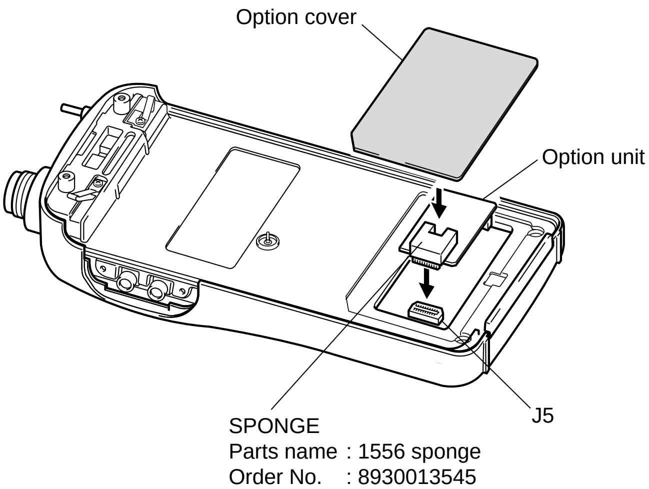
• REMOVING THE MAIN UNIT

① Remove the searing rubber.
② Unsolder 3 points Ⓓ, and unscrew 1 nut Ⓔ.
③ Unscrew 4 screws Ⓕ and 5 screws Ⓖ (silver, 2mm) to separate the chassis and the MAIN unit.
④ Take off the MAIN unit in the direction of the arrow.



3-2 OPTIONAL UNIT INSTALLATIONS

① Remove the option cover.
② Remove the bottom protective paper of spoge.
③ Connect one of UT-96, UT-105, UT-109, UT-110, UT-111, and UT-108 optional unit J5.
④ Replace the option cover to the chassis-hole.



SECTION 4 CIRCUIT DESCRIPTION

4-1 RECEIVER CIRCUITS

4-1-1 ANTENNA SWITCHING CIRCUIT

Received signals are passed through the low-pass filter (L1, L2, C1–C5, C8). The filtered signals are applied to the λ⁄4 type antenna switching circuit (D2, D8).

The antenna switching circuit functions as a low-pass filter while receiving. However, its impedance becomes very high while D2 and D8 are turned ON. Thus transmit signals are blocked from entering the receiver circuits. The antenna switching circuit employs a λ⁄4 type diode switching system. The passed signals are then applied to the RF amplifier circuit.

4-1-2 RF CIRCUIT

The RF circuit amplifies signals within the range of frequency coverage and filters out-of-band signals.

The signals from the antenna switching circuit are amplified at the RF amplifier (Q12) after passing through the tunable bandpass filter (L16, L17, D9, D10, C78–C80, C86, C93, C277). The amplified signals are applied to the 1st mixer circuit (Q13) after out-of-band signals are suppressed at the tunable bandpass filter (D11, D12, L18, L19, C91, C92, C94, C96–C98).

Varactor diodes are employed at the bandpass filters that track the filters and are controlled by the CPU (IC8) via the expander IC (IC10) using T1–T4 signals. These diodes tune the centre frequency of an RF passband for wide bandwidth receiving and good image response rejection.

4-1-3 1ST MIXER AND 1ST IF CIRCUITS

The 1st mixer circuit converts the received signal into a fixed frequency of the 1st IF signal with a PLL output frequency. By changing the PLL frequency, only the desired frequency will pass through a crystal filter at the next stage of the 1st mixer.

The signals from the RF circuit are mixed at the 1st mixer (Q13) with a 1st LO signal coming from the VCO circuit to produce a 31.05 MHz 1st IF signal.

The 1st IF signal is applied to a pair of crystal filters (FI1) to suppress out-of-band signals. The filtered 1st IF signal is applied to the IF amplifier (Q14), then applied to the 2nd mixer circuit (IC2, pin 16).

4-1-4 2ND IF AND DEMODULATOR CIRCUITS

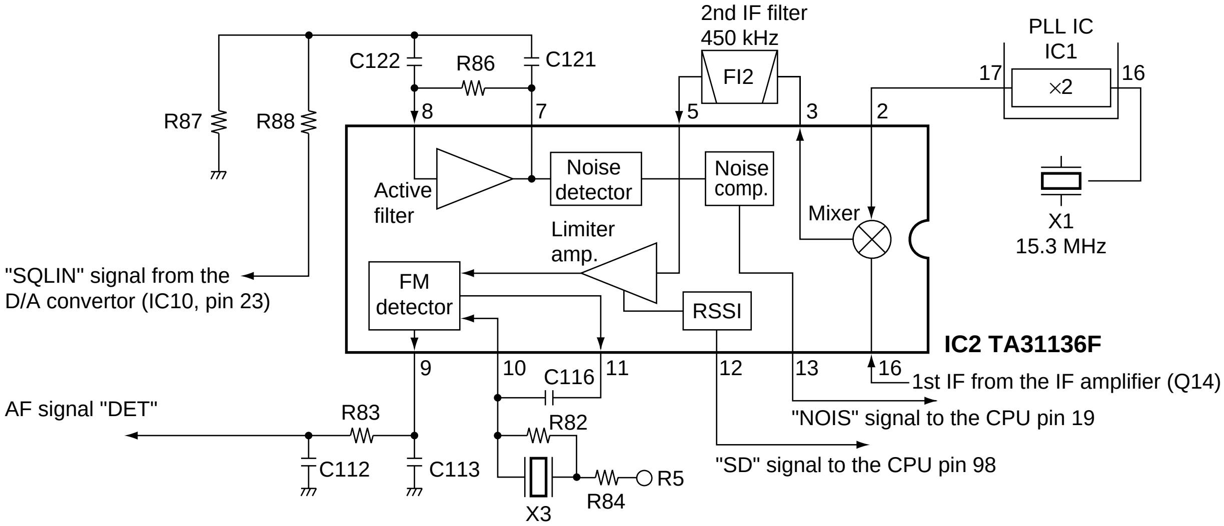
The 2nd mixer circuit converts the 1st IF signal into a 2nd IF signal. A double conversion superheterodyne system (which converts receive signals twice) improves the image rejection ratio and obtains stable receiver gain.

The 1st IF signal from the IF amplifier is applied to the 2nd mixer section of the FM IF IC (IC2, pin 16), and is mixed with the 2nd LO signal to be converted into a 450 kHz 2nd IF signal.

The FM IF IC contains the 2nd mixer, limiter amplifier, quadrature detector and active filter circuits. A 2nd LO signal (30.6 MHz) is produced at the PLL circuit by doubling it’s reference frequency.

The 2nd IF signal from the 2nd mixer (IC2, pin 3) passes through a ceramic filter (FI2) to remove unwanted heterodyned frequencies. It is then amplified at the limiter amplifier (IC2, pin 5) and applied to the quadrature detector (IC2, pins 10, 11) to demodulate the 2nd IF signal into AF signals.

• 2nd IF and demodulator circuits



4-1-5 AF CIRCUIT

AF signals from the FM IF IC (IC2, pin 9) are applied to the mute switch (IC4, pin 1) via the AF filter circuit (IC3b, pins 6, 7). The output signals from pin 11 are applied to the AF power amplifier (IC5, pin 4) after being passed through the [VOL] control (R143).

The applied AF signals are amplified at the AF power amplifier circuit (IC5, pin 4) to obtain the specified audio level. The amplified AF signals, output from pin 10, are applied to the internal speaker (SP1) as the "SP" signal via the [SP] jack when no plug is connected to the jack.

4-1-6 SQUELCH CIRCUIT

A squelch circuit cuts out AF signals when no RF signals are received. By detecting noise components in the AF signals, the squelch switches the AF mute switch.

A portion of the AF signals from the FM IF IC (IC2, pin 9) are applied to the active filter section (IC2, pin 8) where noise components are amplified and detected with an internal noise detector.

The active filter section amplifies noise components. The filtered signals are rectified at the noise detector section and converted into "NOIS" (pulse type) signals at the noise comparator section. The "NOIS" signal is applied to the CPU (IC8, pin 19).

The CPU detects the receiving signal strength from the number of the pulses, and outputs an "RMUT" signal from pin 49. This signal controls the mute switch (IC4) to cut the AF signal line.

4-2 TRANSMITTER CIRCUITS

4-2-1 MICROPHONE AMPLIFIER CIRCUIT

The microphone amplifier circuit amplifies audio signals with +6 dB/octave pre-emphasis characteristics from the microphone to a level needed for the modulation circuit.

The AF signals from the microphone are applied to the microphone amplifier circuit (IC3c, pin 10). The amplified AF signals are passed through the low-pass filter circuit (IC3d, pins 13, 14) via the mute switch (IC4, pins 4, 3). The filtered AF signals are applied to the modulator circuit after being passed through the mute switch (IC4, pins 9, 8).

4-2-2 MODULATION CIRCUIT

The modulation circuit modulates the VCO oscillating signal (RF signal) using the microphone audio signal.

The audio signals change the reactance of a diode (D6) to modulate an oscillated signal at the VCO circuit (Q7, Q8). The oscillated signal is amplified at the buffer-amplifiers (Q4, Q6), then applied to the T/R switching circuit (D3, D4).

4-2-3 DRIVE/POWER AMPLIFIER CIRCUITS

The signal from the VCO circuit passes through the T/R switching circuit (D3) and is amplified at the buffer (Q3), drive (Q2) and power amplifier (Q1) to obtain 5 W of RF power (at 7.2 V DC). The amplified signal passes through the antenna switching circuit (D1), and low-pass filter and is then applied to the antenna connector.

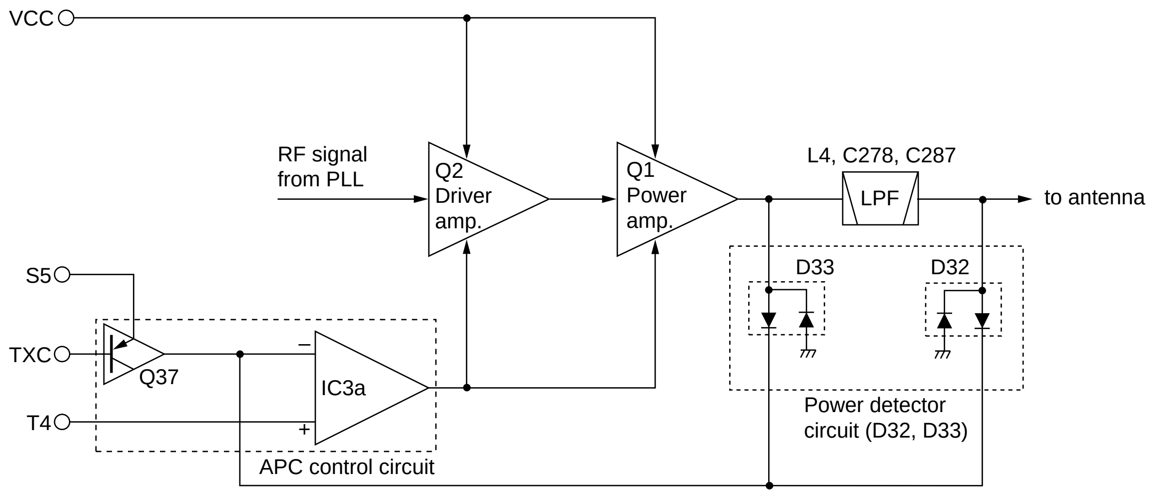
The bias current of the drive (Q2) and the power amplifier (Q1) is controlled by the APC circuit.

4-2-5 APC CIRCUIT

The APC circuit (IC3a, Q37) protects the drive and the power amplifiers from excessive current drive, and selects HIGH or LOW output power.

The signal output from the power detector circuit (D32, D33) is applied to the differential amplifier (IC3a, pin 2), and the "T4" signal from the expander (IC10, pin 11), controlled by the CPU (IC8), is applied to the other input for reference.

• APC circuit



When the driving current is increased, input voltage of the differential amplifier (pin 2) will be increased. In such cases, the differential amplifier output voltage (pin 1) is decreased to reduce the driving current.

4-3 PLL CIRCUIT

A PLL circuit provides stable oscillation of the transmit frequency and receive 1st LO frequency. The PLL output compares the phase of the divided VCO frequency to the reference frequency. The PLL output frequency is controlled by the divided ratio (N-data) of a programmable divider.

The PLL circuit contains the VCO circuit (Q7, Q8). The oscillated signal is amplified at the buffer-amplifiers (Q6, Q5) and then applied to the PLL IC (IC1, pin 2).

The PLL IC contains a prescaler, programmable counter, programmable divider and phase detector, etc. The entered signal is divided at the prescaler and programmable counter section by the N-data ratio from the CPU. The divided signal is detected on phase at the phase detector using the reference frequency.

If the oscillated signal drifts, its phase changes from that of the reference frequency, causing a lock voltage change to compensate for the drift in the oscillated frequency.

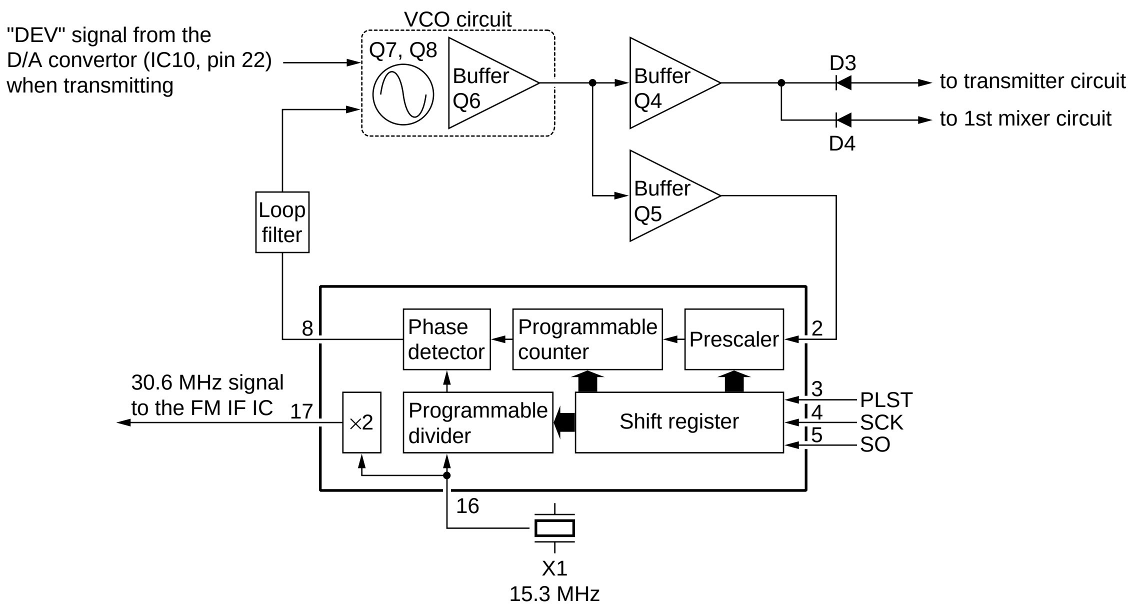
A portion of the VCO signal is amplified at the buffer-amplifier (Q4) and is then applied to the receive 1st mixer (Q13) or transmit buffer-amplifier circuit (Q3) via the T/R switching diode (D3, D4).

4-4 POWER SUPPLY CIRCUITS

VOLTAGE LINE

LINE	DESCRIPTION
HV	The voltage from the attached battery pack.
VCC	The same voltage as the HV line (battery voltage) which is controlled by the power swtich ([VOL] control).
5V	Common 5 V converted from the VCC line by the reference regulator circuit (IC6). The output voltage is applied to the CPU (IC8), the 5 V regulator circuit (Q18, Q19) and reset circuit (IC11).
T5	5 V for transmitter circuits regulated by the T5 regulator circuit (Q22).
R5	5 V for receiver circuits regulated by the R5 regulator circuit (Q21).
S5	Common 5 V converted from the VCC line by the S5 regulator circuit (Q18, Q19).
OPT	The same voltage as the 5V line for the optional HM-46L, EM-71 or HS-51 through a resistor (R132).

• PLL circuit



4-5 PORT ALLOCATIONS

4-5-1 CPU (IC8)

Pin number	Port name	Description
1	VIN	Input port for battely voltage detection.
9	RESET	Input port for RESET signal.
11	CSIFT	Outputs reference oscillator for the CPU control signal.
12	SCK	Outputs clock signal to the PLL IC (IC1), EEPROM (IC7), etc.
15	DAST	• Outputs strobe signals to the expander IC (IC10, pin 6). • Input port for the initial version signal.
16	CLIN	Input port for the cloning signal.
17	CLOUT	Outputs the cloning signal.
18	PLST	Outputs strobe signals to the PLL IC (IC1, pin 3).
19	NOIS	Input for for noise signals (pulse type).
21	BUSY	Outputs BUSY detection. Low: The channel is busy.
36–38	OPV3–OPV1	Input port for the optional unit detection signal from J5.
44–47	KR3–KR0	Output ports for key matrix. Low: When the key is pushed.
49	RMUT	• Outputs RX mute control signal. • Input port for the RX mute signal from optional units.
50	MMUT	• Output TX mute control signal. • Input port for the TX mute signal from optional units.
51	DUSE	Outputs low-pass filter cut-off frequency control signal when DTCS is activated.
52	S5C	Outputs S5 regulator control signal. Low: While power is ON.
53	R5C	Outputs R5 regulator control signal. Low: While receiving.
54	T5C	Outputs T5 regulator control signal. Low: While transmitting.
55	TXC	Outputs APC circuit control signal. High: While transmitting.
56	AFON	Outputs control signal for the regulator circuit of AF power amplifier. High: When squelch is open, etc.
57	LIGT	Outputs LCD backlight control signal. High: Lights ON.
58	ESCK	Outputs EEPROM (IC7, pin 6) clock signal.
59	ESDA	I/O port for data signals from/to EEPROM (IC7, pin 5)

CPU (IC8)–continued

Pin number	Port name	Description
63	UNLK	Input port for unlock signal. High: PLL is unlocked. Low: PLL is locked.
90	MTONE	Output port for: Beep audio while receiving. 2/5-tone signals while transmitting.
91	DTMF	Outputs DTMF tone signal while transmitting.
94	CTCIN	CTCSS/DTCS signals input port for decording.
95	PTT0	Input port for the [PTT] switch. High: While [PTT] switch is pushed.
96	BDET	Input port for the battery's type detection.
97	REM0	Input port for the remote-control signal from external MIC (HM-75).
98	SD	Input port for the RSSI detection.
99	LVIN	Input port for the PLL lock voltage.
100	TEMP	Input port for the transceiver's internal temperature detection.

4-5-2 OUTPUT EXPANDER IC (IC10)

Pin number	Port name	Description
2, 3, 10, 11	T1–T4	Output tunable bandpass filter control signals.
6	DAST	Input port for strobe signal from the CPU (IC8, pin 15).
7	SCK	Input port for clock signal from the CPU (IC8, pin 12).

SECTION 5 ADJUSTMENT PROCEDURES

5-1 PREPARATION

When you adjust the contents on page 5-5 or 5-6, SOFTWARE ADJUSTMENT, the optional CS-F3G ADJ ADJUSTMENT SOFTWARE (Rev. 1.0 or later), OPC-478 CLONING CABLE and a JIG CABLE (see illustration at page 5-2) are required.

■ REQUIRED TEST EQUIPMENT

EQUIPMENT	GRADE AND RANGE	
DC power supply	Output voltage Current capacity	: 7.2 V DC : 5 A or more
RF power meter (terminated type)	Measuring range Frequency range Impedance SWR	: 1–10 W : 120–500 MHz : 50 Ω : Less than 1.2 : 1
Frequency counter	Frequency range Frequency accuracy Sensitivity	: 0.1–500 MHz : ±1 ppm or better : 100 mV or better
FM deviation meter	Frequency range Measuring range	: DC–500 MHz : 0 to ±5 kHz
Digital multimeter	Input impedance	: 10 MΩ/V DC or better
Audio generator	Frequency range Output level	: 300–3000 Hz : 1–500 mV
Attenuator	Power attenuation Capacity	: 40 or 50 dB : 10 W or more
Standard signal generator (SSG)	Frequency range Output level	: 120–500 MHz : 0.1 µV–32 mV (–127 to –17 dBm)
DC voltmeter	Input impedance	: 50 kΩ/V DC or better
Oscilloscope	Frequency range Measuring range	: DC–20 MHz : 0.01–20 V
AC millivoltmeter	Measuring range	: 10 mV–10 V

■ SYSTEM REQUIREMENTS

- IBM PC compatible computer with an RS -232C serial port (38400 bps or faster).
- Microsoft Windows 95 or Windows 98
- Intel i486DX processor or faster (Pentium 100 MHz or faster recommended)
- At least 16 MB RAM and 10 MB of hard disk space
- 640×480 pixel display (800×600 pixel display recommended)

■ ADJUSTMENT SOFTWARE INSTALLATION

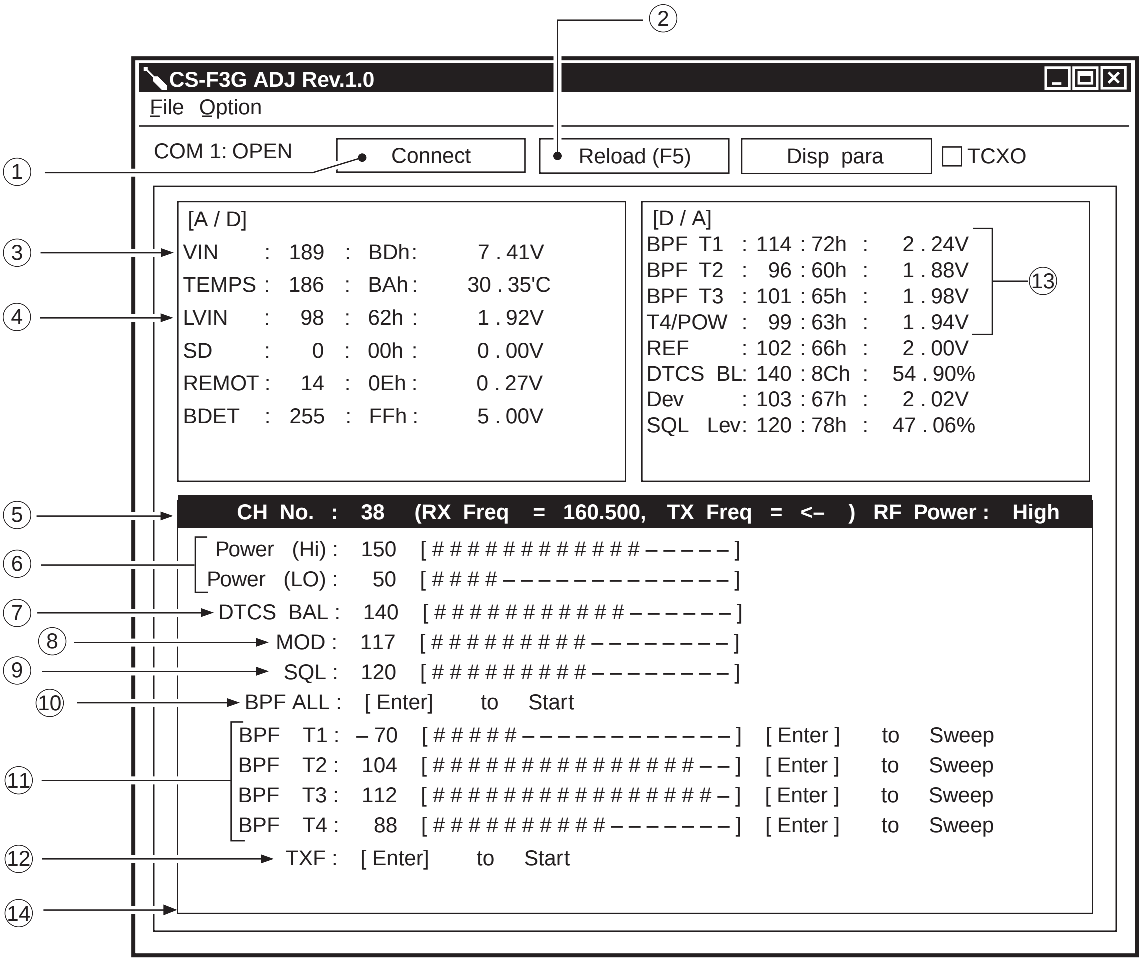
NOTE: Before using the program, make a backup copy of the original disk. After making a backup copy, keep the original disk in a safe place.

① Boot up Windows.
 - Quit all applications when Windows is running.
② Insert the backup disk1 into the appropriate floppy drive.
③ Select ‘Run’ from the [Start] menu.
④ Type the setup program name using the full path name, then push the [Enter] key. (A:\ setup)
⑤ Follow the prompts.
⑥ Program group ‘CS-F3G ADJ’ appears in the ‘Programs’ folder of the [Start] menu.

■ STARTING SOFTWARE ADJUSTMENT

① Connect IC-F3GT/GS and PC with the optional OPC-478 and the JIG cable.
② Boot up Windows, and turn the transceiver power ON.
③ Click the program group ‘CS-F3G ADJ’ in the ‘Programs’ folder of the [Start] menu, then CS-F3G ADJ’s window is appeared.
④ Click ‘Connect’ on the CS-F3G’s window, then appears IC-F3GT/GS’s up-to-date condition.
⑤ Set or modify adjustment data as desired.

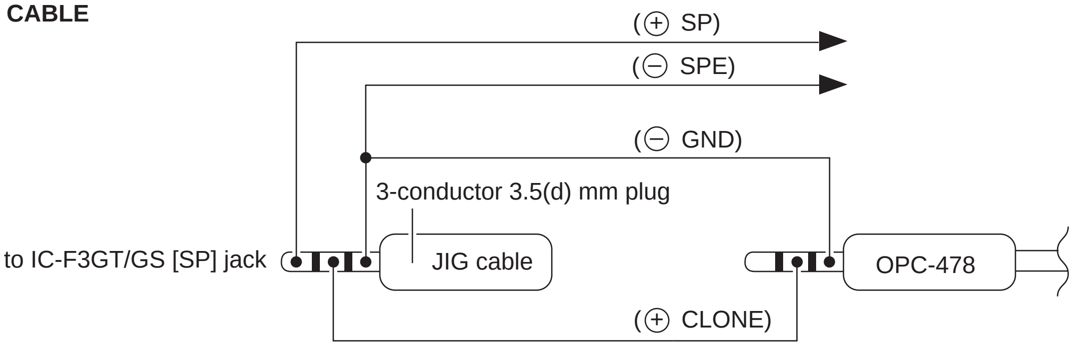
• **ADJUSTMENT SOFTWARE'S SCREEN DISPLAY EXAMPLE**



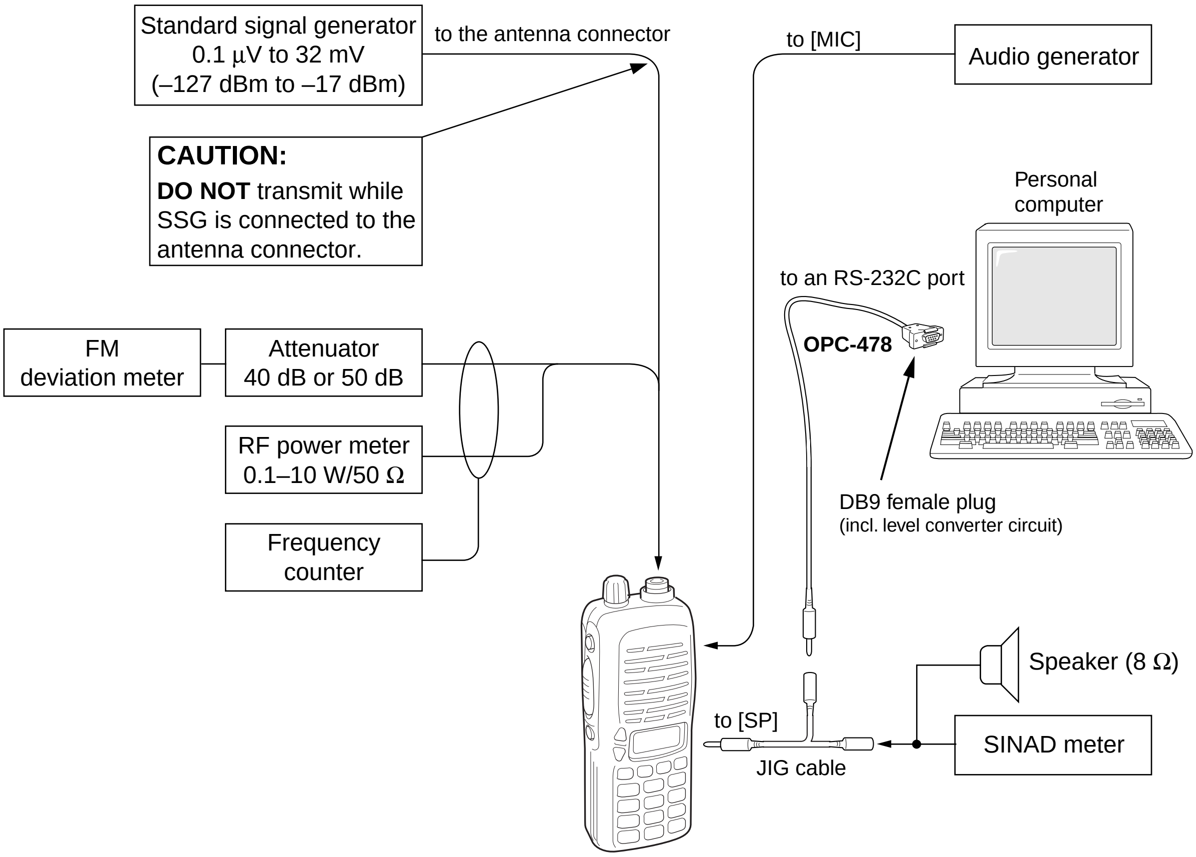
NOTE: The above values for settings are example only.
Each transceiver has its own specific values for each setting.

- ① : Transceiver's connection state
- ② : Reload adjustment data
- ③ : Connected DC voltage
- ④ : PLL lock voltage
- ⑤ : Operating channel select
- ⑥ : RF output power
- ⑦ : DTCS wave form
- ⑧ : FM deviation
- ⑨ : Squelch level
- ⑩ : Receive sensitivity (automatically)
- ⑪ : Receive sensitivity (manually)
- ⑫ : Reference frequency
- ⑬ : Receive sensitivity measurement
- ⑭ : Adjustment items

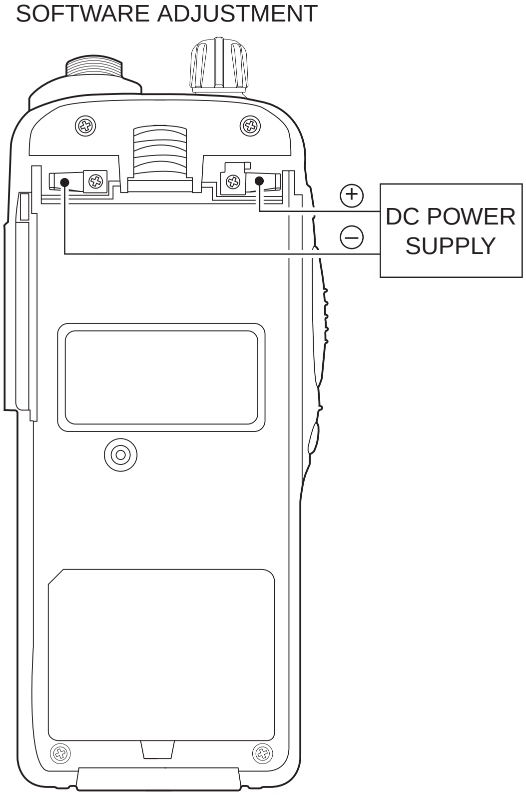
• **JIG CABLE**

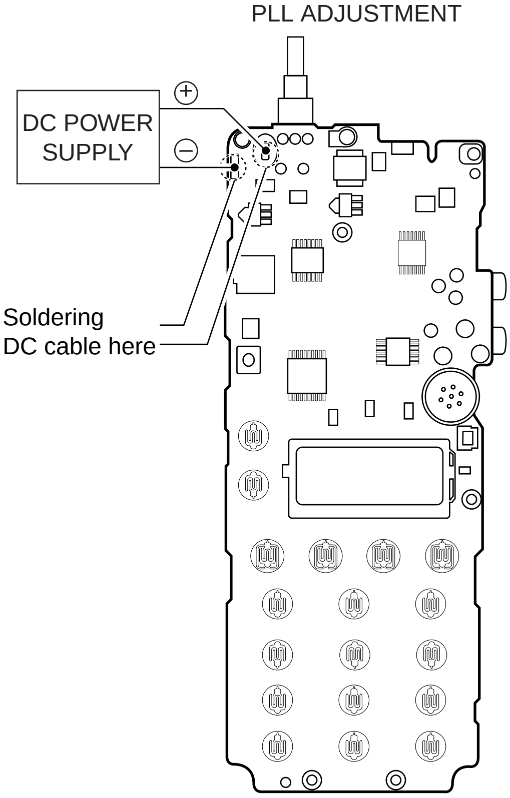


• **CONNECTION**



• **DC POWER CABLE CONNECTIONS**



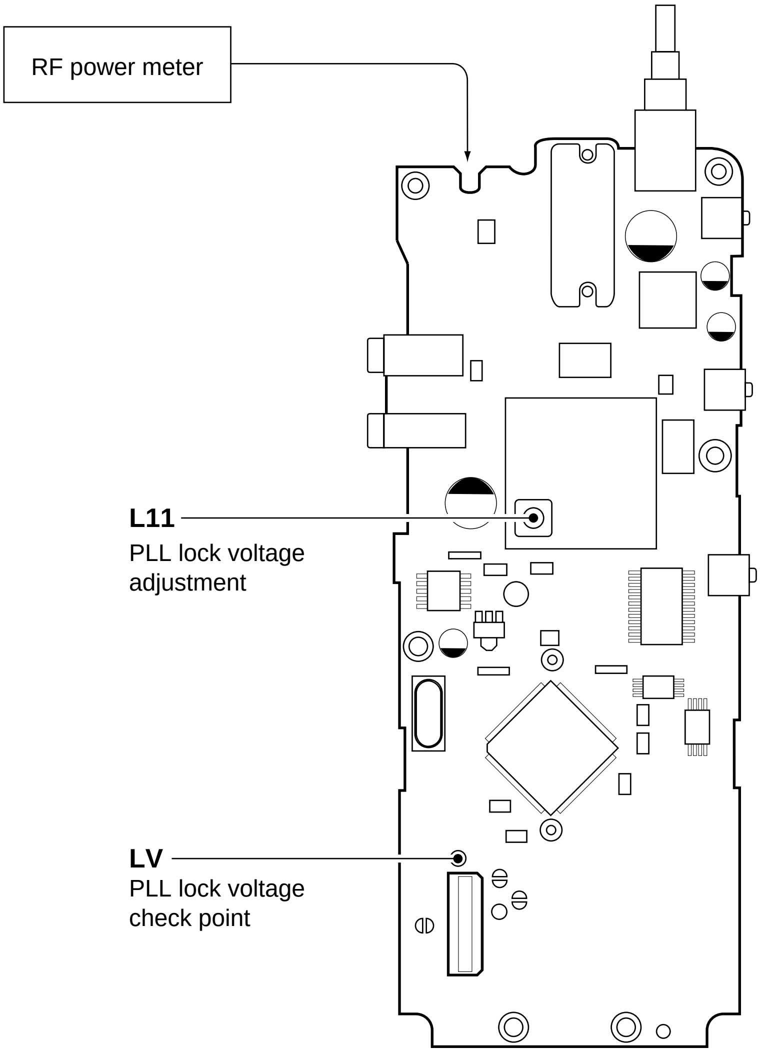


Top view

5-2 PLL ADJUSTMENT

ADJUSTMENT		ADJUSTMENT CONDITIONS	MEASUREMENT		VALUE	ADJUSTMENT	
			UNIT	LOCATION		UNIT	ADJUST
PLL LOCK VOLTAGE	1	• Operating frequency: 146.000 MHz • Receiving	MAIN	Connect a digital multi meter to check point LV.	2.0 V	MAIN	L11
	2	• Transmitting			1.5–2.5 V		Verify

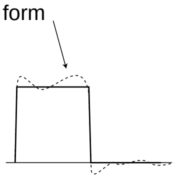
• MAIN unit



Bottom view

5-3 SOFTWARE ADJUSTMENT

Select an operation using [↑] / [↓] keys, then set specified value using [←] / [→] keys on the connected computer keyboard.

ADJUSTMENT		ADJUSTMENT CONDITION	MEASUREMENT		VALUE
			UNIT	LOCATION	
REFERENCE FREQUENCY [TXF]	1	• Operating frequency: 146.000 MHz • High/Low switch : Low • Connect the RF power meter or 50 Ω dummy load to the antenna connector. • Transmitting	Top panel	Loosely couple a frequnecy counter to the antenna connector.	146.00000 MHz
	2	• Transmitting			146.00146 MHz
OUTPUT POWER [POWER(LO)]	1	• Operating frequency: 146.000 MHz • High/Low switch : Low • Transmitting	Top panel	Connect an RF power meter to the antenna connector.	1.0 W
[POWER(HI)]	2	• High/Low switch : High • Transmitting			5.0 W
FM DEVIATION [MOD]	1	• Operating frequency: 146.000 MHz • High/Low switch : Low • Connect the audio generator to the [MIC] jack and set as: 1.0 kHz/150 mVrms • Set the FM deviation meter as: HPF : OFF LPF : 20 kHz De-emphasis : OFF Detector : (P–P)/2 • Transmitting	Top panel	Connect an FM deviation meter to the antenna connector through the attenuator.	±4.2 kHz (W-type) ±2.1 kHz (N-type)
DTCS WAVE FORM [DTCS BAL]	1	• Operating frequency: 160.000 MHz • High/Low switch : Low • No audio applied to the [MIC] jack. • DTCS code : 007 • Transmitting	Top panel	Connect an FM deviation meter with an oscilloscope to the antenna connector through an attenuator.	Set to flat wave form 

SOFTWARE ADJUSTMENT – continued

Select an operation using [↑] / [↓] keys, then set specified value using [←] / [→] keys on the connected computer keyboard.

<table>
<tr><th rowspan="2" colspan="2">ADJUSTMENT</th><th rowspan="2">ADJUSTMENT CONDITION</th><th colspan="2">MEASUREMENT</th><th rowspan="2">VALUE</th></tr>
<tr><th>UNIT</th><th>LOCATION</th></tr>
<tr><td rowspan="2">RX SENSITIVITY
[BPF T1] –
[BPF T4]</td><td>1</td><td>• Operating frequency: 146.000 MHz
• Connect a standard signal generator to the antenna connector and set as:
Frequency : 146.000 MHz
Level : 3.2 μV* (–97 dBm)
Modulation : 1 kHz
Deviation : ±3.5 kHz (W-type)
±1.75 kHz (N-type)
• Receiving</td><td>Top panel</td><td>Connect a SINAD meter with an 8Ω load to the [SP] jack.</td><td>Minimum distortion level</td></tr>
<tr><td colspan="5">CONVENIENT: The BPF T1–BPF T4 can be adjusted automatically.
①-1: Set the cursol to “BPF ALL” on the adjustment program and then push [ENTER] key.
①-2: The connected PC tunes BPF T1–BPF T4 to peak levels.
or
②-1: Set the cursol to one of BPF T1, T2, T3, or T4 as desired.
②-2: Push [ENTER] key to start tuning.
②-3: Repeat ②-1 and ②-2 to perform additional BPF tuning.</td></tr>
<tr><td rowspan="2">SQUELCH LEVEL
[SQL]</td><td>1</td><td>• Operating frequency: 146.000 MHz
• Connect a standard signal generator to the antenna connector and set as:
Frequency : 146.000 MHz
Level : OFF
Modulation : 1 kHz
Deviation : ±3.5 kHz (W-type)
±1.75 kHz (N-type)
• Receiving</td><td rowspan="2">Top panel</td><td rowspan="2">Connect a SINAD meter with an 8Ω load to the [SP] jack.</td><td>12 dB SINAD</td></tr>
<tr><td>2</td><td>• Receiving</td><td>At the point where the audio signals just appears.</td></tr>
</table>

*The output level of the standard signal generator (SSG) is indicated as the SSG’s open circuit.

SECTION 6 PARTS LIST

[MAIN UNIT]

REF NO.	ORDER NO.	DESCRIPTION		
IC1	1130007610	S.IC	µPD3140GS-E1 (DS8)	
IC2	1110003490	S.IC	TA31136FN (D,EL)	
IC3	1110003780	S.IC	NJM2902V-TE1	
IC4	1130008090	S.IC	BU4066BCFV-E1	
IC5	1110001810	S.IC	TA7368F (TP1)	
IC6	1180001740	S.IC	TK11250BMCL	
IC7	1130009680	S.IC	HN58X2432TI	
IC8	1140003750	S.IC	HD6473877H (Z-TAT)	
IC10	1190000350	S.IC	M62363FP-650C	
IC11	1130009110	S.IC	S-80942ANMP-DD6-T2	
IC12	1110003800	S.IC	NJM2904V-TE1	
Q1	1560001050	S.FET	2SK2974	
Q2	1560001020	S.FET	2SK2973 (MTS101P)	
Q3	1530003230	S.TRANSISTOR	2SC5085-Y (TE85R)	
Q4	1530002600	S.TRANSISTOR	2SC4215-O (TE85R)	
Q5	1530002600	S.TRANSISTOR	2SC4215-O (TE85R)	
Q6	1530002600	S.TRANSISTOR	2SC4215-O (TE85R)	
Q7	1530003230	S.TRANSISTOR	2SC5085-Y (TE85R)	
Q8	1530003230	S.TRANSISTOR	2SC5085-Y (TE85R)	
Q10	1530002690	S.TRANSISTOR	2SC4116-GR (TE85R)	
Q11	1590001190	S.TRANSISTOR	XP6501-(TX) .AB	
Q12	1580000730	S.FET	3SK293 (TE85L)	
Q13	1580000720	S.FET	3SK239AXRTL	
Q14	1530002600	S.TRANSISTOR	2SC4215-O (TE85R)	
Q15	1520000460	S.TRANSISTOR	2SB1132 T100 R	
Q16	1590001190	S.TRANSISTOR	XP6501-(TX) .AB	
Q17	1590002530	S.TRANSISTOR	UN911H (TX)	
Q18	1520000460	S.TRANSISTOR	2SB1132 T100 R	
Q19	1590001190	S.TRANSISTOR	XP6501-(TX) .AB	
Q20	1590000720	S.TRANSISTOR	DTA144EUA T106	
Q21	1510000920	S.TRANSISTOR	2SA1577 T107 Q	
Q22	1510000920	S.TRANSISTOR	2SA1577 T107 Q	
Q25	1530002690	S.TRANSISTOR	2SC4116-GR (TE85R)	
Q31	1590000660	S.TRANSISTOR	DTC144TU T107	
Q32	1590000430	S.TRANSISTOR	DTC144EUA T106	
Q33	1590000430	S.TRANSISTOR	DTC144EUA T106	
Q34	1560000810	S.FET	2SK1069-4-TL	
Q35	1530002690	S.TRANSISTOR	2SC4116-GR (TE85R)	
Q36	1530002690	S.TRANSISTOR	2SC4116-GR (TE85R)	
Q37	1590000720	S.TRANSISTOR	DTA144EUA T106	
Q38	1590000430	S.TRANSISTOR	DTC144EUA T106	
D1	1790000620	S.DIODE	MA77 (TX)	
D2	1790000620	S.DIODE	MA77 (TX)	
D3	1790000620	S.DIODE	MA77 (TX)	
D4	1790000620	S.DIODE	MA77 (TX)	
D5	1750000710	S.VARICAP	HVC350BTRF	
D6	1790001260	S.DIODE	MA2S077-(TX)	
D7	1720000660	S.VARICAP	1SV288 (TPH2)	
D8	1790000620	S.DIODE	MA77 (TX)	
D9	1720000370	S.VARICAP	HVU350TRF	
D10	1720000370	S.VARICAP	HVU350TRF	
D11	1720000370	S.VARICAP	HVU350TRF	
D12	1720000370	S.VARICAP	HVU350TRF	
D13	1750000710	S.VARICAP	HVC350BTRF	
D14	1790000620	S.DIODE	MA77 (TX)	
D26	1160000070	S.DIODE	DAN202K T146	
D27	1790001670	S.DIODE	RB706F-40T106	
D28	1790000620	S.DIODE	MA77 (TX)	
D29	1730002260	S.ZENER	MA8030-H (TX)	
D32	1790001670	S.DIODE	RB706F-40T106	
D33	1790001670	S.DIODE	RB706F-40T106	
FI1	2010002430	S.XTAL	FL-311 (31.05 MHz)	[Narrow]
	2010002440	S.XTAL	FL-312 (31.05 MHz)	[Wide]
FI2	2020001080	S.CERAMIC	SFPC450G-TC01	[Narrow]
	2020001490	S.CERAMIC	SFPC450E-TC01	[Wide]
X1	6050010880	S.XTAL	CR-664 (15.3 MHz)	
X2	6050010870	S.XTAL	CR-663 (9.200 MHz)	
X3	6070000210	S.DISCRIMINATOR	CDBCA450CX24	

[MAIN UNIT]

REF NO.	ORDER NO.	DESCRIPTION		
L1	6200008580	S.COIL	0.30-1.4-6TL 32N	
L2	6200008500	S.COIL	0.30-1.3-6TL 28N	
L4	6200008280	S.COIL	0.30-1.7-7TL 50N	
L5	6200008510	S.COIL	0.30-0.9-4TR 10.5N	
L6	6200007730	S.COIL	LQN21A 39NJ04	
L7	6200009180	S.COIL	ELJRE R10J-F3	
L8	6200009180	S.COIL	ELJRE R10J-F3	
L9	6200009180	S.COIL	ELJRE R10J-F3	
L10	6200009180	S.COIL	ELJRE R10J-F3	
L11	6200004850	S.COIL	MC152-E558CN-100024	
L12	6200003710	S.COIL	NL 252018T-2R7J	
L13	6200001980	S.COIL	NL 252018T-1R0J	
L14	6200009150	S.COIL	ELJRE 82NJ-F3	
L15	6200008280	S.COIL	0.30-1.7-7TL 50N	
L16	6200007750	S.COIL	LQN21A 56NJ04	
L17	6200007750	S.COIL	LQN21A 56NJ04	
L18	6200007750	S.COIL	LQN21A 56NJ04	
L19	6200007750	S.COIL	LQN21A 56NJ04	
L20	6200004770	S.COIL	ELJNC R56J-F	[Wide]
	6200005540	S.COIL	ELJNC R47K-F	[Narrow]
L21	6200009170	S.COIL	ELJRE 47NJ-F2	
L22	6200008280	S.COIL	0.30-1.7-7TL 50N	
L24	6200003090	S.COIL	NL 322522T-2R7J-3	
L25	6200001980	S.COIL	NL 252018T-1R0J	
L26	6200003590	S.COIL	EXCCL3225U1	
L28	6200009150	S.COIL	ELJRE 82NJ-F3	
L29	6200009180	S.COIL	ELJRE R10J-F3	
L31	6200008490	S.COIL	0.30-0.9-3TR 7.5N	
L32	6200008330	S.COIL	0.45-1.4-4TL 15N	
L33	6200001980	S.COIL	NL 252018T-1R0J	
L34	6200004920	S.COIL	MLF1608A 2R2K-T	
R1	7030003670	S.RESISTOR	ERJ3GEYJ 823 V (82 kΩ)	
R2	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)	
R3	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)	
R5	7030003240	S.RESISTOR	ERJ3GEYJ 220 V (22 Ω)	
R7	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)	
R9	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)	
R10	7030003310	S.RESISTOR	ERJ3GEYJ 820 V (82 Ω)	
R11	7030003450	S.RESISTOR	ERJ3GEYJ 122 V (1.2 kΩ)	
R12	7030003500	S.RESISTOR	ERJ3GEYJ 332 V (3.3 kΩ)	
R13	7030003260	S.RESISTOR	ERJ3GEYJ 330 V (33 Ω)	
R14	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)	
R15	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)	
R16	7030004050	S.RESISTOR	ERJ3GEYJ 1R0 V (1 Ω)	
R17	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)	
R18	7030003630	S.RESISTOR	ERJ3GEYJ 393 V (39 kΩ)	
R19	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)	
R20	7030003660	S.RESISTOR	ERJ3GEYJ 683 V (68 kΩ)	
R21	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)	
R22	7030003660	S.RESISTOR	ERJ3GEYJ 683 V (68 kΩ)	
R23	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)	
R25	7030005040	S.RESISTOR	ERJ2GEJ 472 X (4.7 kΩ)	
R26	7030005040	S.RESISTOR	ERJ2GEJ 472 X (4.7 kΩ)	
R27	7030003400	S.RESISTOR	ERJ3GEYJ 471 V (470 Ω)	
R28	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)	
R29	7030005120	S.RESISTOR	ERJ2GEJ 102 X (1 kΩ)	
R30	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)	
R31	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)	
R32	7030003410	S.RESISTOR	ERJ3GEYJ 561 V (560 Ω)	
R33	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)	
R34	7030003200	S.RESISTOR	ERJ3GEYJ 100 V (10 Ω)	
R35	7030003420	S.RESISTOR	ERJ3GEYJ 681 V (680 Ω)	
R41	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)	
R44	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)	[Narrow]
	7030003590	S.RESISTOR	ERJ3GEYJ 183 V (18 kΩ)	[Wide]
R45	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)	
R48	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)	
R49	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)	
R50	7030003760	S.RESISTOR	ERJ3GEYJ 474 V (470 kΩ)	
R51	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)	
R52	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)	
R53	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)	
R54	7030003710	S.RESISTOR	ERJ3GEYJ 184 V (180 kΩ)	
R57	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)	

S.=Surface mount

[MAIN UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
R58	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R59	7030003400	S.RESISTOR	ERJ3GEYJ 471 V (470 Ω)
R61	7030003280	S.RESISTOR	ERJ3GEYJ 470 V (47 Ω)
R62	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R63	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R64	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R65	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R66	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R67	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R68	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R69	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R70	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R72	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R75	7030003330	S.RESISTOR	ERJ3GEYJ 121 V (120 Ω)
R77	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R79	7030003410	S.RESISTOR	ERJ3GEYJ 561 V (560 Ω) [Narrow]
	7030003450	S.RESISTOR	ERJ3GEYJ 122 V (1.2 kΩ) [Wide]
R80	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R81	7030003460	S.RESISTOR	ERJ3GEYJ 152 V (1.5 kΩ)
R82	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ) [Wide]
	7030003510	S.RESISTOR	ERJ3GEYJ 392 V (3.9 kΩ) [Narrow]
R83	7030003400	S.RESISTOR	ERJ3GEYJ 471 V (470 Ω)
R84	7030003390	S.RESISTOR	ERJ3GEYJ 391 V (390 Ω)
R85	7030003460	S.RESISTOR	ERJ3GEYJ 152 V (1.5 kΩ)
R86	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ) [Narrow]
	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ) [Wide]
R87	7030003400	S.RESISTOR	ERJ3GEYJ 471 V (470 Ω) [Wide]
	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ) [Narrow]
R88	7030003620	S.RESISTOR	ERJ3GEYJ 333 V (33 kΩ) [Narrow]
	7030003630	S.RESISTOR	ERJ3GEYJ 393 V (39 kΩ) [Wide]
R89	7030003450	S.RESISTOR	ERJ3GEYJ 122 V (1.2 kΩ)
R90	7030003780	S.RESISTOR	ERJ3GEYJ 684 V (680 kΩ)
R93	7030003610	S.RESISTOR	ERJ3GEYJ 273 V (27 kΩ)
R94	7030003800	S.RESISTOR	ERJ3GEYJ 105 V (1 MΩ)
R95	7030003800	S.RESISTOR	ERJ3GEYJ 105 V (1 MΩ)
R96	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R97	7030003720	S.RESISTOR	ERJ3GEYJ 224 V (220 kΩ)
R98	7030003710	S.RESISTOR	ERJ3GEYJ 184 V (180 kΩ)
R99	7030003570	S.RESISTOR	ERJ3GEYJ 123 V (12 kΩ)
R100	7030003470	S.RESISTOR	ERJ3GEYJ 182 V (1.8 kΩ)
R101	7030003800	S.RESISTOR	ERJ3GEYJ 105 V (1 MΩ)
R102	7030003200	S.RESISTOR	ERJ3GEYJ 100 V (10 Ω)
R103	7030003570	S.RESISTOR	ERJ3GEYJ 123 V (12 kΩ)
R104	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R105	7030003390	S.RESISTOR	ERJ3GEYJ 391 V (390 Ω) [Wide]
	7030003400	S.RESISTOR	ERJ3GEYJ 471 V (470 Ω) [Narrow]
R107	7030003700	S.RESISTOR	ERJ3GEYJ 154 V (150 kΩ)
R108	7030003700	S.RESISTOR	ERJ3GEYJ 154 V (150 kΩ)
R109	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R112	7030003800	S.RESISTOR	ERJ3GEYJ 105 V (1 MΩ)
R113	7030003660	S.RESISTOR	ERJ3GEYJ 683 V (68 kΩ)
R114	7030003600	S.RESISTOR	ERJ3GEYJ 223 V (22 kΩ) [Wide]
	7030003620	S.RESISTOR	ERJ3GEYJ 333 V (33 kΩ) [Narrow]
R115	7030003690	S.RESISTOR	ERJ3GEYJ 124 V (120 kΩ)
R116	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R117	7030003460	S.RESISTOR	ERJ3GEYJ 152 V (1.5 kΩ)
R120	7030003660	S.RESISTOR	ERJ3GEYJ 683 V (68 kΩ)
R121	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R122	7030003490	S.RESISTOR	ERJ3GEYJ 272 V (2.7 kΩ)
R123	7030003500	S.RESISTOR	ERJ3GEYJ 332 V (3.3 kΩ)
R125	7030003610	S.RESISTOR	ERJ3GEYJ 273 V (27 kΩ)
R126	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R127	7030003260	S.RESISTOR	ERJ3GEYJ 330 V (33 Ω)
R128	7030003200	S.RESISTOR	ERJ3GEYJ 100 V (10 Ω)
R130	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R131	7030003400	S.RESISTOR	ERJ3GEYJ 471 V (470 Ω)
R132	7030003400	S.RESISTOR	ERJ3GEYJ 471 V (470 Ω)
R134	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)
R135	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R136	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R137	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R139	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R140	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R141	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R142	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R143	7210003060	VARIABLE	TP76N00N-15F-10KA-2251
R144	7030003600	S.RESISTOR	ERJ3GEYJ 223 V (22 kΩ)
R145	7030003800	S.RESISTOR	ERJ3GEYJ 105 V (1 MΩ)
R146	7030003570	S.RESISTOR	ERJ3GEYJ 123 V (12 kΩ)
R147	7030003570	S.RESISTOR	ERJ3GEYJ 123 V (12 kΩ)
R148	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R150	7030003400	S.RESISTOR	ERJ3GEYJ 471 V (470 Ω)

[MAIN UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
R151	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R152	7030003760	S.RESISTOR	ERJ3GEYJ 474 V (470 kΩ)
R153	7030003760	S.RESISTOR	ERJ3GEYJ 474 V (470 kΩ)
R154	7030003760	S.RESISTOR	ERJ3GEYJ 474 V (470 kΩ)
R155	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R159	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R160	7030003340	S.RESISTOR	ERJ3GEYJ 151 V (150 Ω)
R161	7030003600	S.RESISTOR	ERJ3GEYJ 223 V (22 kΩ)
R162	7030003600	S.RESISTOR	ERJ3GEYJ 223 V (22 kΩ)
R163	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)
R164	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ) [F3GT] only
R165	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ) [F3GS] only
R168	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R169	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ) [Narrow]
	7030003570	S.RESISTOR	ERJ3GEYJ 123 V (12 kΩ) [Wide]
R170	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R171	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R174	7030003580	S.RESISTOR	ERJ3GEYJ 153 V (15 kΩ)
R175	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R176	7030003510	S.RESISTOR	ERJ3GEYJ 392 V (3.9 kΩ)
R177	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R178	7030003510	S.RESISTOR	ERJ3GEYJ 392 V (3.9 kΩ)
R181	7030005870	S.RESISTOR	RR0816R-104-D (100 kΩ)
R182	7510001280	S.THERMISTOR	NTCCM20124AG473J-T
R184	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R185	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R186	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R187	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R190	7030003600	S.RESISTOR	ERJ3GEYJ 223 V (22 kΩ)
R191	7030003600	S.RESISTOR	ERJ3GEYJ 223 V (22 kΩ)
R192	7030003600	S.RESISTOR	ERJ3GEYJ 223 V (22 kΩ)
R193	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R194	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R195	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R196	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R197	7030003650	S.RESISTOR	ERJ3GEYJ 563 V (56 kΩ)
R198	7030003590	S.RESISTOR	ERJ3GEYJ 183 V (18 kΩ)
R199	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ) [Wide]
	7030004050	S.RESISTOR	ERJ3GEYJ 1R0 V (1 Ω) [Narrow]
R200	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ) [Wide]
	7030004050	S.RESISTOR	ERJ3GEYJ 1R0 V (1 Ω) [Narrow]
R201	7030003780	S.RESISTOR	ERJ3GEYJ 684 V (680 kΩ) [Narrow] only
R202	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R203	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R204	7030003500	S.RESISTOR	ERJ3GEYJ 332 V (3.3 kΩ)
R205	7030003460	S.RESISTOR	ERJ3GEYJ 152 V (1.5 kΩ)
R206	7030003760	S.RESISTOR	ERJ3GEYJ 474 V (470 kΩ) [Wide] only
R207	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R208	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R209	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R210	7030003510	S.RESISTOR	ERJ3GEYJ 392 V (3.9 kΩ)
R211	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R212	7030003660	S.RESISTOR	ERJ3GEYJ 683 V (68 kΩ)
R213	7030003400	S.RESISTOR	ERJ3GEYJ 471 V (470 Ω)
R215	7030005870	S.RESISTOR	RR0816R-104-D (100 kΩ)
R216	7030005870	S.RESISTOR	RR0816R-104-D (100 kΩ)
R218	7030003690	S.RESISTOR	ERJ3GEYJ 124 V (120 kΩ)
R219	7030003690	S.RESISTOR	ERJ3GEYJ 124 V (120 kΩ)
R220	7030003730	S.RESISTOR	ERJ3GEYJ 274 V (270 kΩ)
R221	7030003740	S.RESISTOR	ERJ3GEYJ 334 V (330 kΩ)
R222	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R223	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R224	7030003610	S.RESISTOR	ERJ3GEYJ 273 V (27 kΩ)
R225	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R226	7410000950	S.ARRAY	EXB-V8V 102JV
R227	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R228	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R229	7030003710	S.RESISTOR	ERJ3GEYJ 184 V (180 kΩ)
R230	7030003650	S.RESISTOR	ERJ3GEYJ 563 V (56 kΩ)
R231	7030003600	S.RESISTOR	ERJ3GEYJ 223 V (22 kΩ)
R232	7410000950	S.ARRAY	EXB-V8V 102JV
R234	7030003600	S.RESISTOR	ERJ3GEYJ 223 V (22 kΩ)
R235	7030003780	S.RESISTOR	ERJ3GEYJ 684 V (680 kΩ)
R236	7410000950	S.ARRAY	EXB-V8V 102JV
R237	7410000950	S.ARRAY	EXB-V8V 102JV
R238	7410000950	S.ARRAY	EXB-V8V 102JV
R239	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R240	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)

S.=Surface mount

[MAIN UNIT]

REF NO.	ORDER NO.	DESCRIPTION		
R241	7030003800	S.RESISTOR	ERJ3GEYJ 105 V (1 MΩ)	
R242	7030003800	S.RESISTOR	ERJ3GEYJ 105 V (1 MΩ)	
R243	7030003800	S.RESISTOR	ERJ3GEYJ 105 V (1 MΩ)	
R244	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)	
R245	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)	
R246	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)	
R249	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)	
R251	7030003740	S.RESISTOR	ERJ3GEYJ 334 V (330 kΩ)	
R252	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)	
R253	7030003400	S.RESISTOR	ERJ3GEYJ 471 V (470 Ω)	
R255	7030003290	S.RESISTOR	ERJ3GEYJ 560 V (56 Ω)	
R257	7030004050	S.RESISTOR	ERJ3GEYJ 1R0 V (1 Ω)	
R258	7030003620	S.RESISTOR	ERJ3GEYJ 333 V (33 kΩ)	
R260	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)	
R261	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)	
R262	7030003470	S.RESISTOR	ERJ3GEYJ 182 V (1.8 kΩ)	[Narrow]
	7030004050	S.RESISTOR	ERJ3GEYJ 1R0 V (1 Ω)	[Wide]
R264	7030003660	S.RESISTOR	ERJ3GEYJ 683 V (68 kΩ)	[Wide]
	7030003700	S.RESISTOR	ERJ3GEYJ 154 V (150 kΩ)	[Narrow]
R265	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)	
R266	7030003580	S.RESISTOR	ERJ3GEYJ 153 V (15 kΩ)	
R267	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)	[Narrow]
	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)	[Wide]
C1	4030007030	S.CERAMIC	C1608 CH 1H 150J-T-A	
C2	4030011770	S.CERAMIC	C1608 CH 1H 060B-T-A	
C3	4030008560	S.CERAMIC	C1608 CH 1H 300J-T-A	
C4	4030007000	S.CERAMIC	C1608 CH 1H 090D-T-A	
C5	4030007040	S.CERAMIC	C1608 CH 1H 180J-T-A	
C8	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A	
C10	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A	
C13	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A	
C14	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A	
C15	4030007120	S.CERAMIC	C1608 CH 1H 820J-T-A	
C17	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A	
C18	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A	
C19	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A	
C20	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A	
C21	4550006540	S.TANTALUM	ECST1CY475R	
C22	4030007060	S.CERAMIC	C1608 CH 1H 270J-T-A	
C23	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A	
C24	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A	
C25	4030011770	S.CERAMIC	C1608 CH 1H 060B-T-A	
C26	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A	
C27	4030007040	S.CERAMIC	C1608 CH 1H 180J-T-A	
C28	4030007020	S.CERAMIC	C1608 CH 1H 120J-T-A	
C29	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A	
C30	4030007050	S.CERAMIC	C1608 CH 1H 220J-T-A	
C31	4030009920	S.CERAMIC	C1608 CH 1H 050B-T-A	
C32	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A	
C33	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A	
C34	4030009500	S.CERAMIC	C1608 CH 1H 0R5B-T-A	
C35	4030013850	S.CERAMIC	ECUE1E102KBQ	
C36	4030013850	S.CERAMIC	ECUE1E102KBQ	
C37	4030014020	S.CERAMIC	ECUE1H020BCQ	
C38	4030014030	S.CERAMIC	ECUE1H2R5BCQ	
C39	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A	
C41	4030016800	S.CERAMIC	ECUE1H300JCQ	
C42	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A	
C44	4030013850	S.CERAMIC	ECUE1E102KBQ	
C45	4030014440	S.CERAMIC	ECUE1H820JCQ	
C46	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A	
C47	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N	
C48	4550006170	S.TANTALUM	ECST1AY225R	
C49	4550006590	S.TANTALUM	ECST1CY684R	
C50	4550006200	S.TANTALUM	ECST0JY106R	
C51	4030007090	S.CERAMIC	C1608 CH 1H 470J-T-A	
C52	4030007050	S.CERAMIC	C1608 CH 1H 220J-T-A	
C53	4030007040	S.CERAMIC	C1608 CH 1H 180J-T-A	
C54	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A	
C55	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A	
C56	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A	
C60	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A	
C61	4030007020	S.CERAMIC	C1608 CH 1H 120J-T-A	
C62	4030007000	S.CERAMIC	C1608 CH 1H 090D-T-A	
C63	4030007100	S.CERAMIC	C1608 CH 1H 560J-T-A	
C64	4030009910	S.CERAMIC	C1608 CH 1H 040B-T-A	
C65	4030009520	S.CERAMIC	C1608 CH 1H 020B-T-A	
C66	4030007040	S.CERAMIC	C1608 CH 1H 180J-T-A	
C67	4030007010	S.CERAMIC	C1608 CH 1H 100D-T-A	
C69	4030007070	S.CERAMIC	C1608 CH 1H 330J-T-A	

[MAIN UNIT]

REF NO.	ORDER NO.	DESCRIPTION		
C70	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A	
C71	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N	
C72	4550006150	S.TANTALUM	ECST1CY105R	
C73	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N	
C75	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N	
C76	4030006990	S.CERAMIC	C1608 CH 1H 080D-T-A	
C78	4030007010	S.CERAMIC	C1608 CH 1H 100D-T-A	
C79	4030009920	S.CERAMIC	C1608 CH 1H 050B-T-A	
C80	4030009530	S.CERAMIC	C1608 CH 1H 030B-T-A	
C81	4030007130	S.CERAMIC	C1608 CH 1H 101J-T-A	
C82	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A	
C83	4030009510	S.CERAMIC	C1608 CH 1H 010B-T-A	
C84	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A	
C85	4030007160	S.CERAMIC	C1608 CH 1H 181J-T-A	
C86	4030009920	S.CERAMIC	C1608 CH 1H 050B-T-A	
C87	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A	
C88	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A	
C89	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A	
C90	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A	
C91	4030009920	S.CERAMIC	C1608 CH 1H 050B-T-A	
C92	4030007130	S.CERAMIC	C1608 CH 1H 101J-T-A	
C93	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A	
C94	4030009510	S.CERAMIC	C1608 CH 1H 010B-T-A	
C95	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A	
C96	4030007160	S.CERAMIC	C1608 CH 1H 181J-T-A	
C97	4030009920	S.CERAMIC	C1608 CH 1H 050B-T-A	
C98	4030009920	S.CERAMIC	C1608 CH 1H 050B-T-A	
C99	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A	
C100	4030007080	S.CERAMIC	C1608 CH 1H 390J-T-A	
C101	4030007100	S.CERAMIC	C1608 CH 1H 560J-T-A	
C102	4030007030	S.CERAMIC	C1608 CH 1H 150J-T-A	
C104	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A	
C105	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A	
C106	4030007090	S.CERAMIC	C1608 CH 1H 470J-T-A	[Wide]
	4030007100	S.CERAMIC	C1608 CH 1H 560J-T-A	[Narrow]
C107	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A	
C108	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A	
C109	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A	
C110	4030007000	S.CERAMIC	C1608 CH 1H 090D-T-A	[Narrow]
	4030009350	S.CERAMIC	C1608 CH 1H 3R5B-T-A	[Wide]
C111	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A	
C112	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A	
C113	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A	
C114	4030008900	S.CERAMIC	C1608 JB 1C 333K-T-A	
C115	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A	
C116	4030007120	S.CERAMIC	C1608 CH 1H 820J-T-A	[Narrow]
	4030007140	S.CERAMIC	C1608 CH 1H 121J-T-A	[Wide]
C117	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A	
C118	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A	
C119	4030008680	S.CERAMIC	C2012 JF 1C 105Z-T-A	
C120	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N	
C121	4030007170	S.CERAMIC	C1608 CH 1H 221J-T-A	
C122	4030007170	S.CERAMIC	C1608 CH 1H 221J-T-A	
C123	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A	
C124	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A	
C125	4030006870	S.CERAMIC	C1608 JB 1H 222K-T-A	
C126	4030008470	S.CERAMIC	C1608 JB 1H 272K-T-A	
C128	4030008680	S.CERAMIC	C2012 JF 1C 105Z-T-A	
C129	4550006680	S.TANTALUM	ECST0JY156R	
C131	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A	
C132	4030008770	S.CERAMIC	C1608 JB 1H 562K-T-A	
C133	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N	
C134	4030007170	S.CERAMIC	C1608 CH 1H 221J-T-A	
C135	4030007160	S.CERAMIC	C1608 CH 1H 181J-T-A	
C136	4030008770	S.CERAMIC	C1608 JB 1H 562K-T-A	
C137	4030008890	S.CERAMIC	C1608 JB 1C 273K-T-A	[F3GS]
	4030008900	S.CERAMIC	C1608 JB 1C 333K-T-A	[F3GT]
C138	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A	
C139	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N	
C140	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N	
C144	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A	
C145	4510004630	S.ELECTROLYTIC	ECEV1CA100SR	
C146	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A	
C147	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A	
C148	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A	
C149	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N	
C150	4550006200	S.TANTALUM	ECST0JY106R	
C151	4030007090	S.CERAMIC	C1608 CH 1H 470J-T-A	
C152	4030008920	S.CERAMIC	C1608 JB 1C 473K-T-A	
C153	4510006940	S.ELECTROLYTIC	EEVFC0J101P	
C154	4550006200	S.TANTALUM	ECST0JY106R	
C155	4510004630	S.ELECTROLYTIC	ECEV1CA100SR	

S.=Surface mount

[MAIN UNIT]

REF NO.	ORDER NO.	DESCRIPTION		
C156	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N	
C158	4550006200	S.TANTALUM	ECST0JY106R	
C159	4030006850	S.CERAMIC	C1608 JB 1H 471K-T-A	
C160	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A	
C161	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A	
C162	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A	
C163	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A	
C164	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A	
C165	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A	
C166	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A	
C167	4030007090	S.CERAMIC	C1608 CH 1H 470J-T-A	
C168	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A	
C169	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A	
C171	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N	
C173	4510004640	S.ELECTROLYTIC	ECEV1CA470SP	
C174	4510005430	S.ELECTROLYTIC	ECEV0JA220SR	
C179	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A	
C193	4030006990	S.CERAMIC	C1608 CH 1H 080D-T-A	
C194	4030007030	S.CERAMIC	C1608 CH 1H 150J-T-A	
C195	4030007100	S.CERAMIC	C1608 CH 1H 560J-T-A	
C196	4030006850	S.CERAMIC	C1608 JB 1H 471K-T-A	
C197	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N	
C198	4550006170	S.TANTALUM	ECST1AY225R	
C199	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N	
C200	4030008900	S.CERAMIC	C1608 JB 1C 333K-T-A	
C201	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N	
C202	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A	
C204	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A	
C205	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A	
C209	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N	
C211	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N	
C212	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A	
C213	4550006170	S.TANTALUM	ECST1AY225R	
C214	4030008900	S.CERAMIC	C1608 JB 1C 333K-T-A	
C215	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N	
C216	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N	
C217	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N	
C218	4030013850	S.CERAMIC	ECUE1E102KBQ	
C219	4030009630	S.CERAMIC	C1608 JB 1H 822K-T-A	
C221	4030008910	S.CERAMIC	C1608 JB 1C 393K-T-A	
C222	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N	
C223	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A	
C224	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A	
C225	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A	[Narrow]
	4030009880	S.CERAMIC	C1608 JB 1H 682K-T-A	[Wide]
C227	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N	
C228	4030009490	S.CERAMIC	C1608 JB 1H 821K-T-A	
C229	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A	
C230	4030008880	S.CERAMIC	C1608 JB 1C 223K-T-A	
C231	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A	
C232	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A	
C233	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A	
C234	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A	
C235	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N	
C236	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A	
C243	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A	
C244	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A	
C245	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A	
C248	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A	
C249	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A	
C250	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A	
C251	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A	
C252	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A	
C277	4030009520	S.CERAMIC	C1608 CH 1H 020B-T-A	[Wide]
	4030009540	S.CERAMIC	C1608 CH 1H 1R5B-T-A	[Narrow]
C278	4030009990	S.CERAMIC	C1608 CH 1H 200J-T-A	
C280	4030007090	S.CERAMIC	C1608 CH 1H 470J-T-A	
C281	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A	
C282	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A	
C283	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A	
C285	4030007090	S.CERAMIC	C1608 CH 1H 470J-T-A	
C286	4030006870	S.CERAMIC	C1608 JB 1H 222K-T-A	
C287	4030009990	S.CERAMIC	C1608 CH 1H 200J-T-A	
C288	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A	
C289	4030007090	S.CERAMIC	C1608 CH 1H 470J-T-A	
C290	4030007030	S.CERAMIC	C1608 CH 1H 150J-T-A	
C293	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N	
C294	4550006110	S.TANTALUM	TEMSVB2 0J 336M8L	
C295	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A	
C296	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A	
C297	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A	
C298	4550006540	S.TANTALUM	ECST1CY475R	

[MAIN UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
C299	4030011340	S.CERAMIC	C1608 CH 1H 471J-T-A
C300	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C301	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C302	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C303	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C304	4030008920	S.CERAMIC	C1608 JB 1C 473K-T-A
J2	6450001680	CONNECTOR	HSJ1122-010010
J3	6450001690	CONNECTOR	HSJ1456-01-220
J5	6510018430	S.CONNECTOR	AXN330C038P
J6	6510021900	S.CONNECTOR	BM02B-ASRS-TF
DS1	5030001800	LCD	LM-7045B
DS2	5010000160	S.LED	LNJ310M6URA
DS3	5010000160	S.LED	LNJ310M6URA
MC1	7700002160	MICROPHON	KUC3523-040245
S1	2230000900	S.SWITCH	JPM1990-2013R
S2	2230000900	S.SWITCH	JPM1990-2013R
S3	2230000900	S.SWITCH	JPM1990-2013R
SP1	2510001060	SPEAKER	K036NA500-47
W5	8900009640	CABLE	OPC-963
W7	7030003860	S.JUMPER	ERJ3GE JPW V
W8	7030003860	S.JUMPER	ERJ3GE JPW V
EP1	0910051872	PCB	B 5386B
EP2	8930051310	LCD CONTACT	SRCN-2251-SP-N-W

S.=Surface mount

SECTION 7 MECHANICAL PARTS AND DISASSEMBLY

[CHASSIS PARTS]

REF. NO.	ODER NO.	DESCRIPTION		QTY.
MP1	8210016750	2251-T front panel	[F3GT]	1
	8210016740	2251-S front panel	[F3GS]	1
MP2	8930050890	2251 terminal holder		1
MP3	8010017990	2251 chassis		1
MP4	8210016570	2251 rear panel		1
MP5	8930050870	2251 release button		1
MP7	8310047580	2251 window plate		1
MP8	8930051350	2251 jack rubber		1
MP9	8210016550	2251 jack panel		1
MP10	8610010780	Knob N-276		1
MP12	8930050820	2251 main seal		1
MP13	8930050790	2251 10key	[F3GT]	1
	8930050590	2251 6key	[F3GS]	1
MP14	8930050840	2251 minus terminal		1
MP15	8930050850	2251 plus terminal		1
MP18	8930050880	2251 spring holder		1
MP20	8930042350	1922 mic sheet		1
MP21	8930051300	2251 mic sponge		1
MP22	8930051290	2251 opt sheet		1
MP23	8830001340	1903 hex nut		1
MP24	8930050900	2251 window sheet		1
MP25	8930036751	Spring		1
MP26	8950005260	Ant connector-102		1
MP27	8830001250	Ant connector-101		1
MP31	8810009510	Screw BT M2 x 4 NI-ZU		8
MP32	8810009560	Screw BT M2 x 6 ZK		7
MP33	8810000100	Screw M2 x 4 ZK		4
MP36	8930051330	2251 contact rubber		1
MP37	8930050800	2251 jack cap		1
MP38	8950005240	2251 contact spring		1
MP39	8860001210	2251 ANT rug		1
MP40	8930051750	Sponge		1
MP41	8510012900	2251 shield plate		1

Screw abbreviations

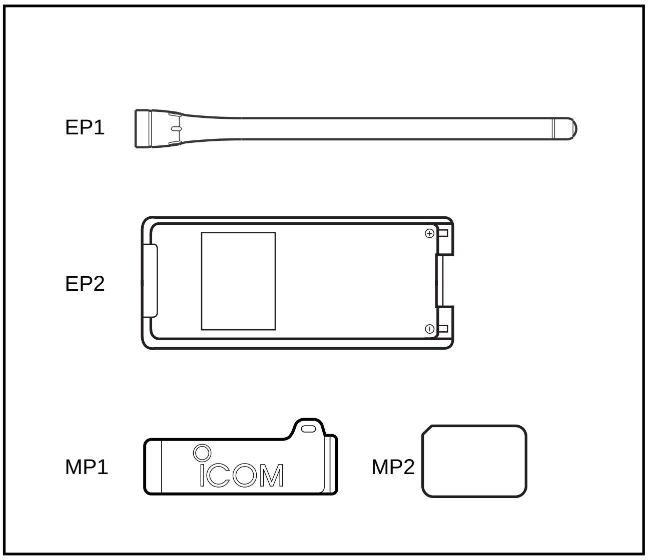
A, B0, BT: Self-tapping
PH: Pan head
FH: Flat head
BiH: Bind head
SUS: Stainless
NI: Nickel
ZK: Black

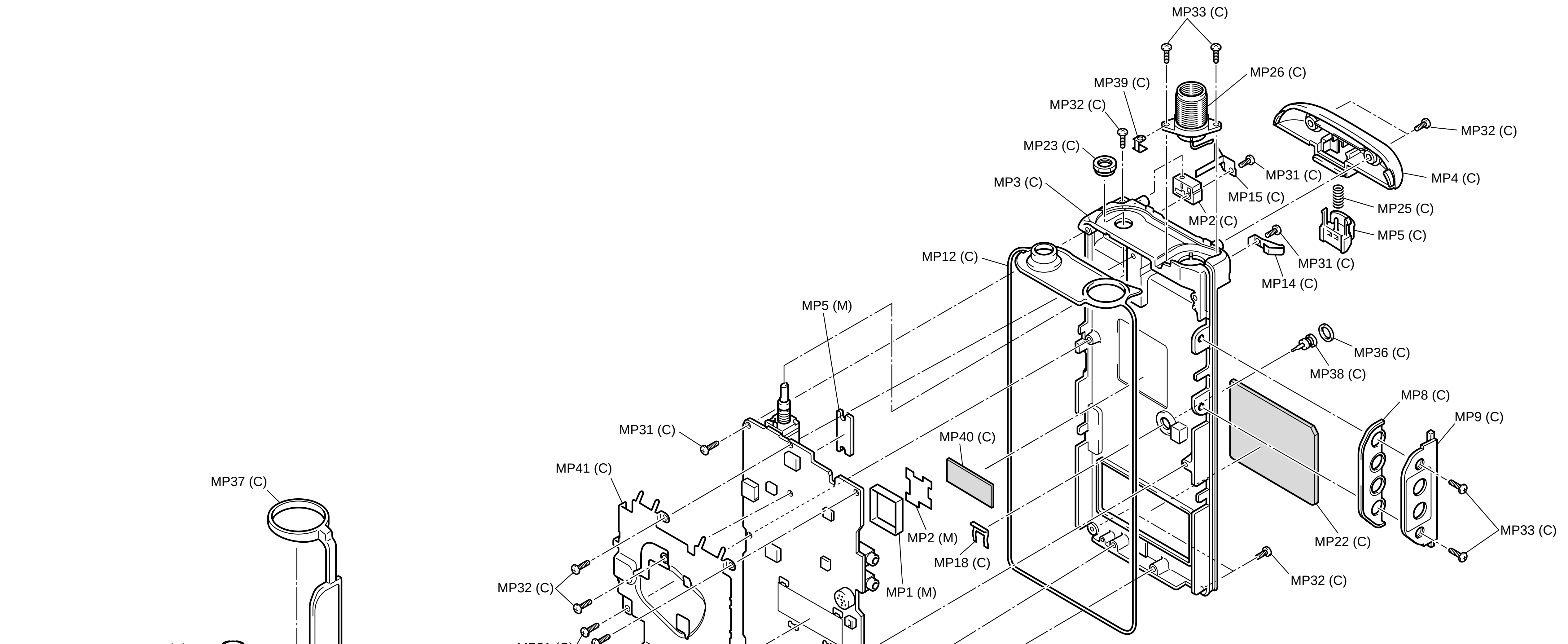
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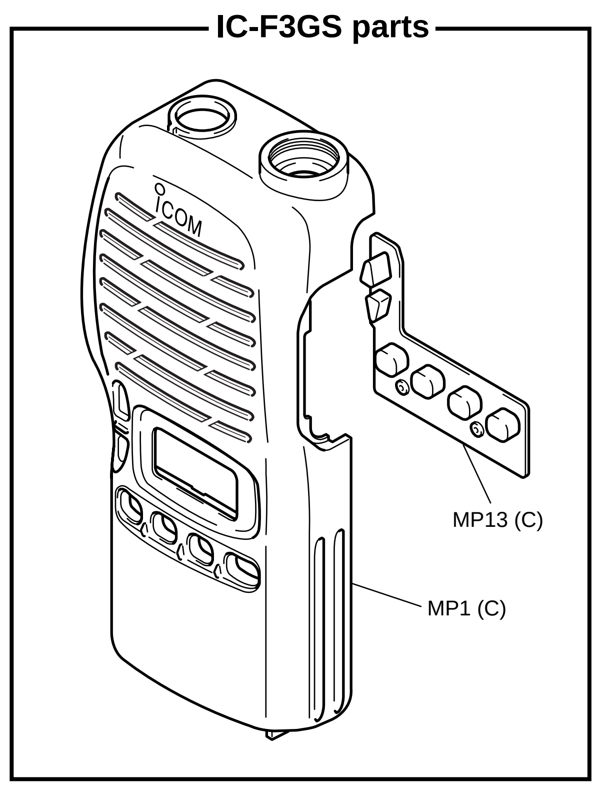
REF. NO.	ODER NO.	DESCRIPTION	QTY.
SP1	2510001060	Speaker K036NA500-47	1
EP2	8930051310	LCD contact SRCN-2251-SP-N-W	1
MP1	8510011111	1922 VCO case-1	1
MP2	8510011101	1922 VCO cover-1	1
MP3	8930050810	2251 LCD holder	1
MP4	8210016580	2251 reflector	1
MP5	8410002230	2078 PA heatsink	1

[ACCESSORIES]

REF. NO.	ODER NO.	DESCRIPTION	QTY.
EP1	3310002330	Antenna FA-SC25V	1
	3310002320	Antenna FA-SC55V	1
EP2	0800005400	Battery BC-209	1
MP1	8930042040	1922 Belt clip	1
MP2	8930051290	2251 OPT sheet	1



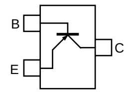
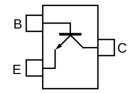
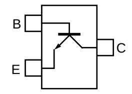
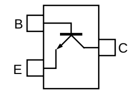
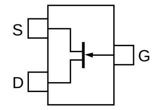
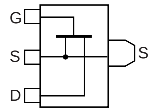
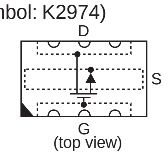
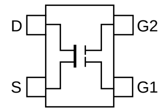
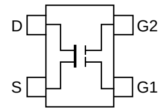
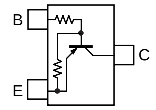
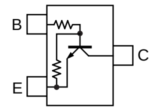
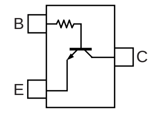
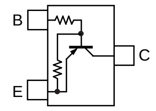
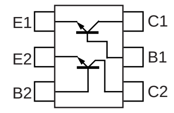




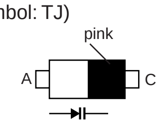
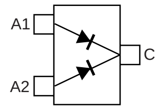
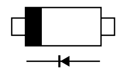
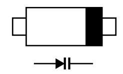
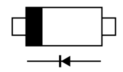
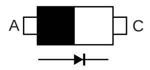
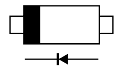
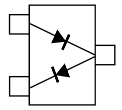
UNIT abbreviation (C): CHASSIS PARTS, (M): MAIN UNIT

SECTION 8 SEMI-CONDUCTOR INFORMATION

• TRANSISTOR AND FET'S

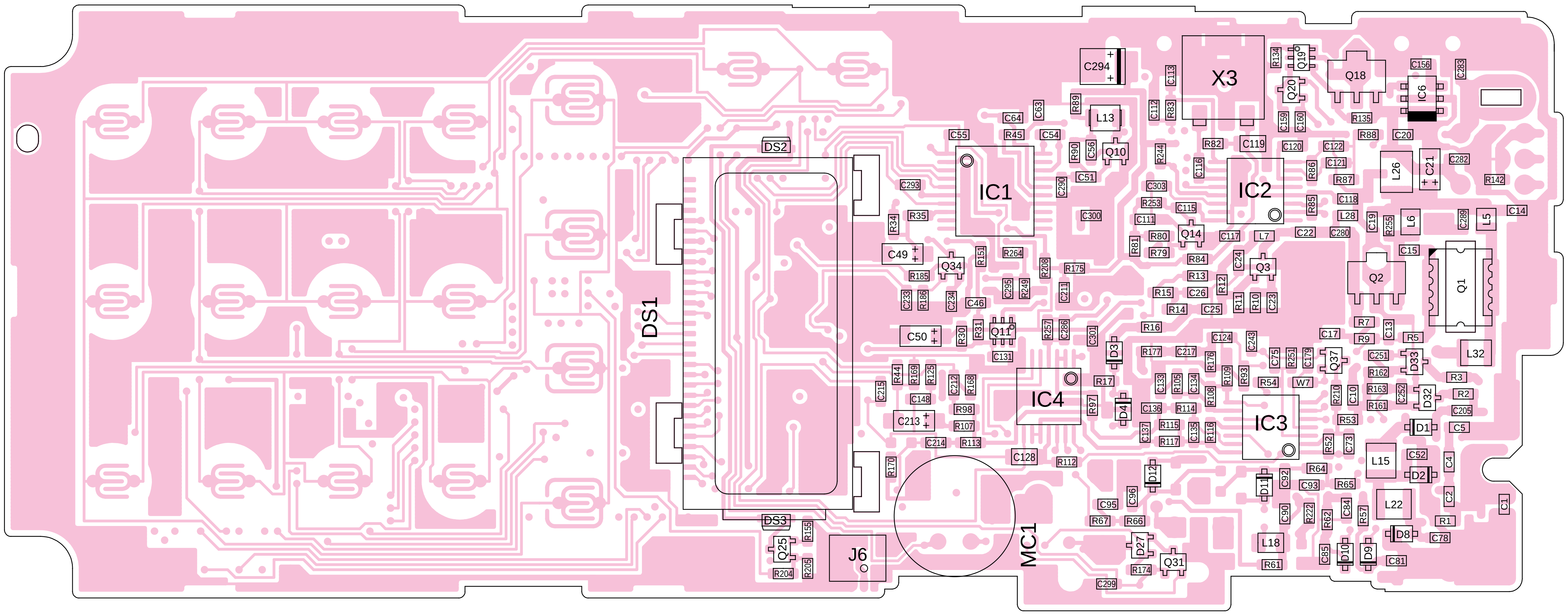
2SA1577 Q (Symbol: HQ) 	**2SC4116 GR** (Symbol: LG) 	**2SC4215 O** (Symbol: QO) 	**2SC5085 Y** (Symbol: MCY) 	**2SK1069 4** (Symbol: FJ4) 
2SK2973 (Symbol: K1) 	**2SK2974** (Symbol: K2974) 	**3SK239 A** (Symbol: XR) 	**3SK293** (Symbol: UF) 	**DTA144 EU** (Symbol: 16) 
DTC144 EU (Symbol: 26) 	**DTC144 TU** (Symbol: 06) 	**UN911 H** (Symbol: 6P) 	**XP6501 AB** (Symbol: 5N) 	

• DIODES

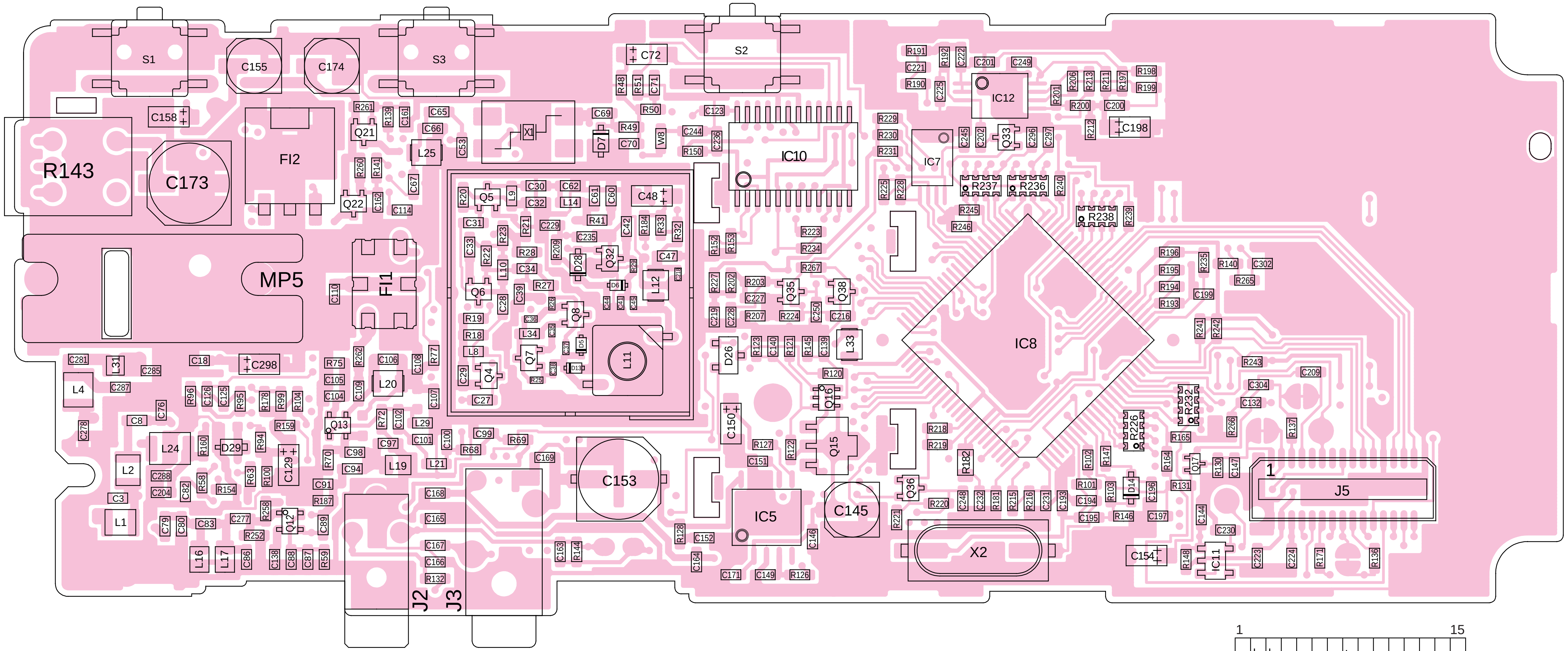
1SV288 (Symbol: TJ) 	**DAN202K** (Symbol: N) 	**HVC350B** (Symbol: BO) 	**HVU350** (Symbol: 4) 	**MA2S077** (Symbol: S) 
MA77 (Symbol: 4B) 	**MA8030 H** (Symbol: 3^0) 	**RB706F-40** (Symbol: 3J) 		

MAIN UNIT

• TOP VIEW



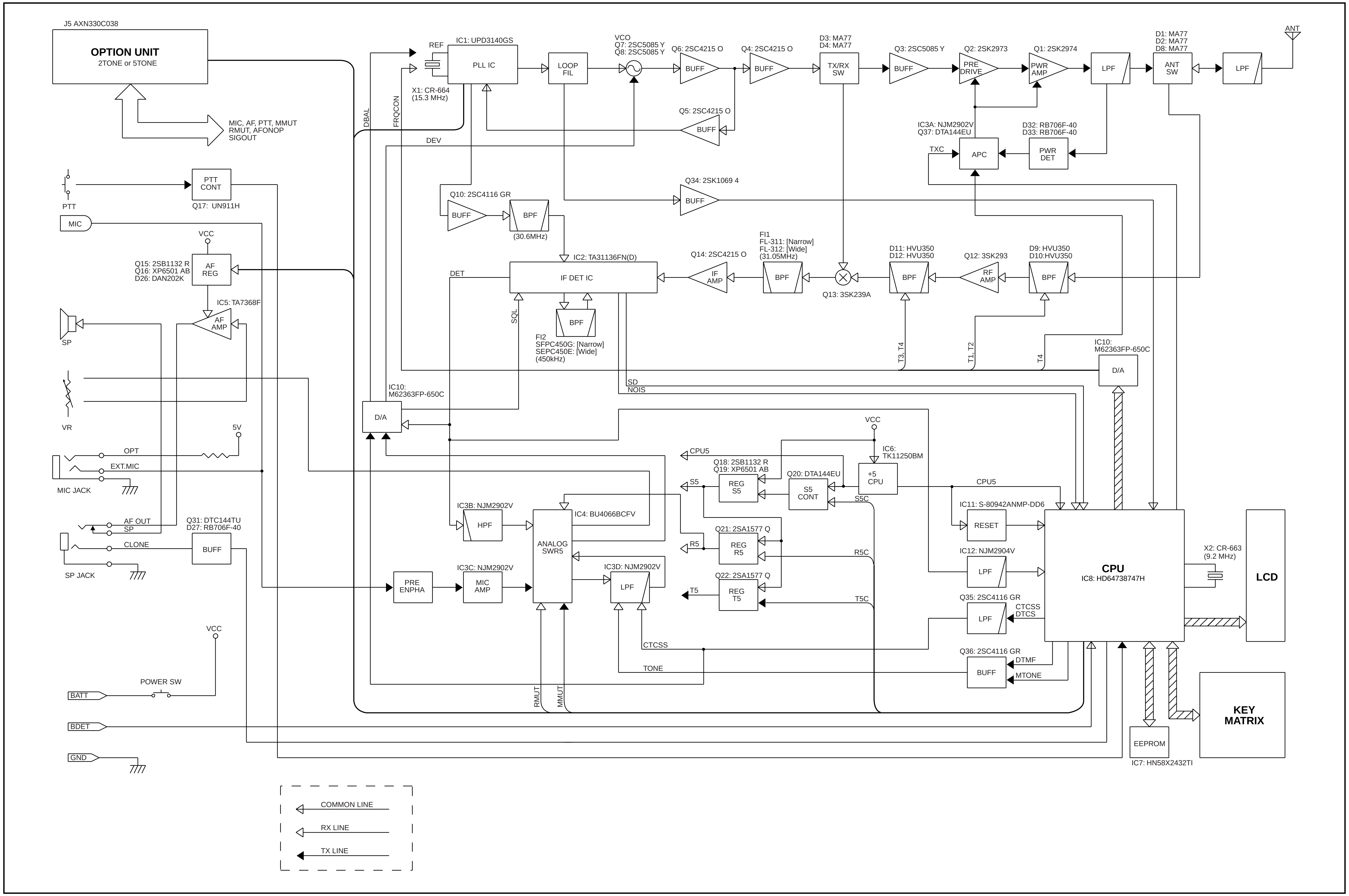
• **BOTTOM VIEW**



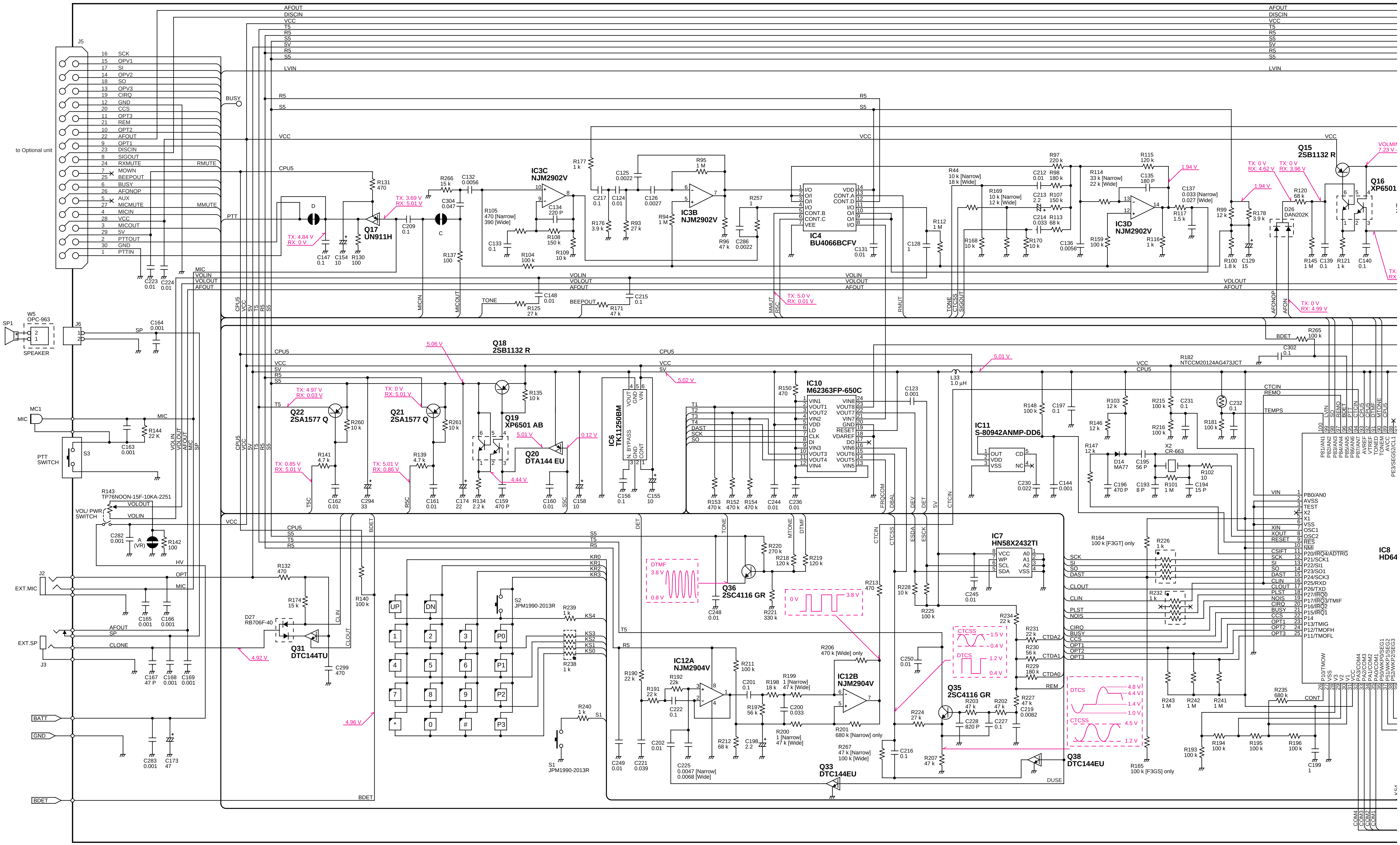
Pin	Signal	Pin	Signal
1	PTTIN	16	SCK
2	PTTOUT	17	SI
3	MICOUT	18	SO
4	MICIN	19	CIRQ
5	AUX	20	CCS
6	BUSY	21	REM
7	MOWN	22	AFOUT
8	SIGOUT	23	DISCIN
9	OPT1	24	RXMUTE
10	OPT2	25	BEEPOUT
11	OPT3	26	AFONOP
12	GND	27	MICMUTE
13	OPV3	28	VCC
14	OPV2	29	5V
15	OPV1	30	GND

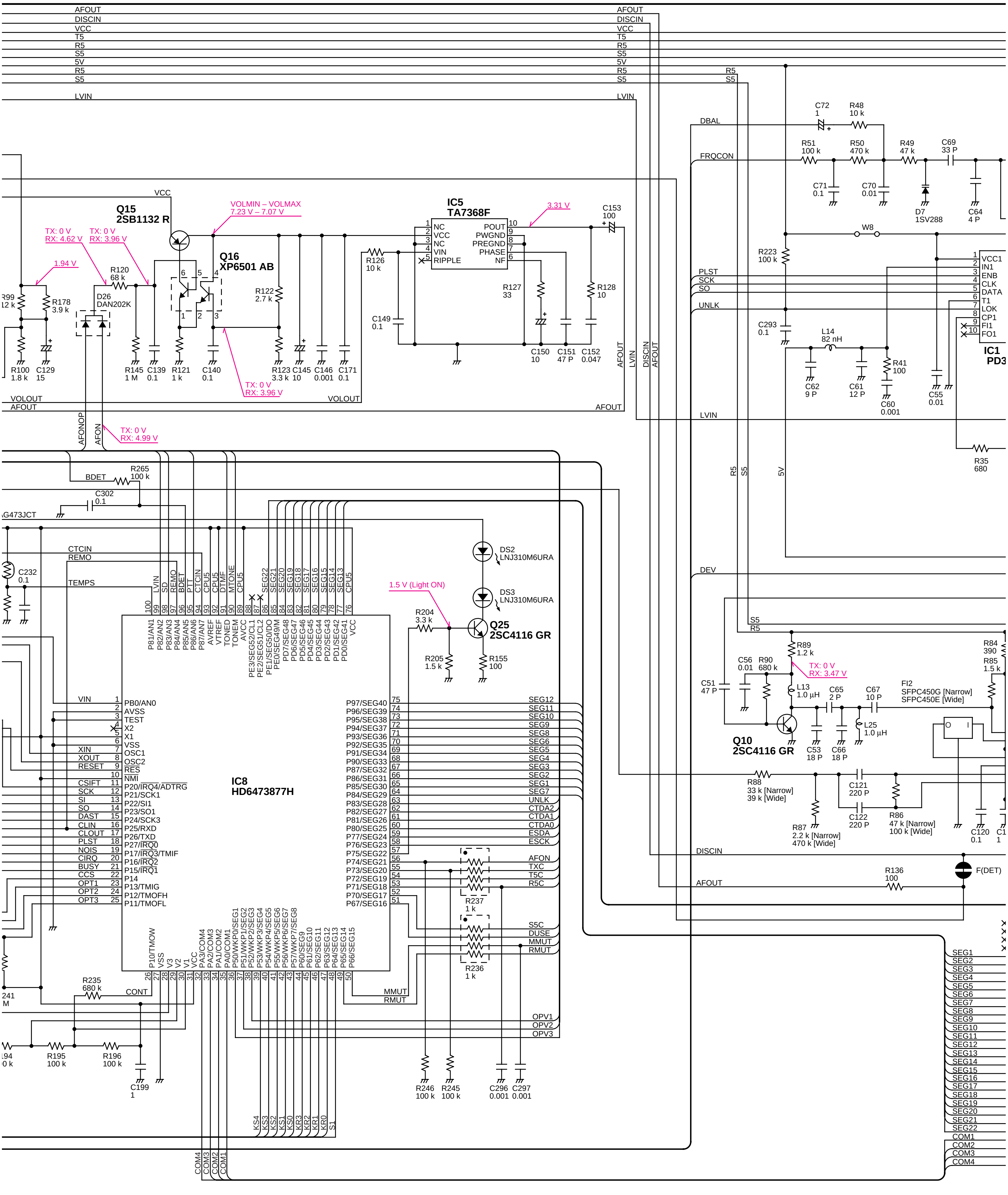
J5
to the OPTIONAL unit

SECTION 10 BILOCK DIAGRAM

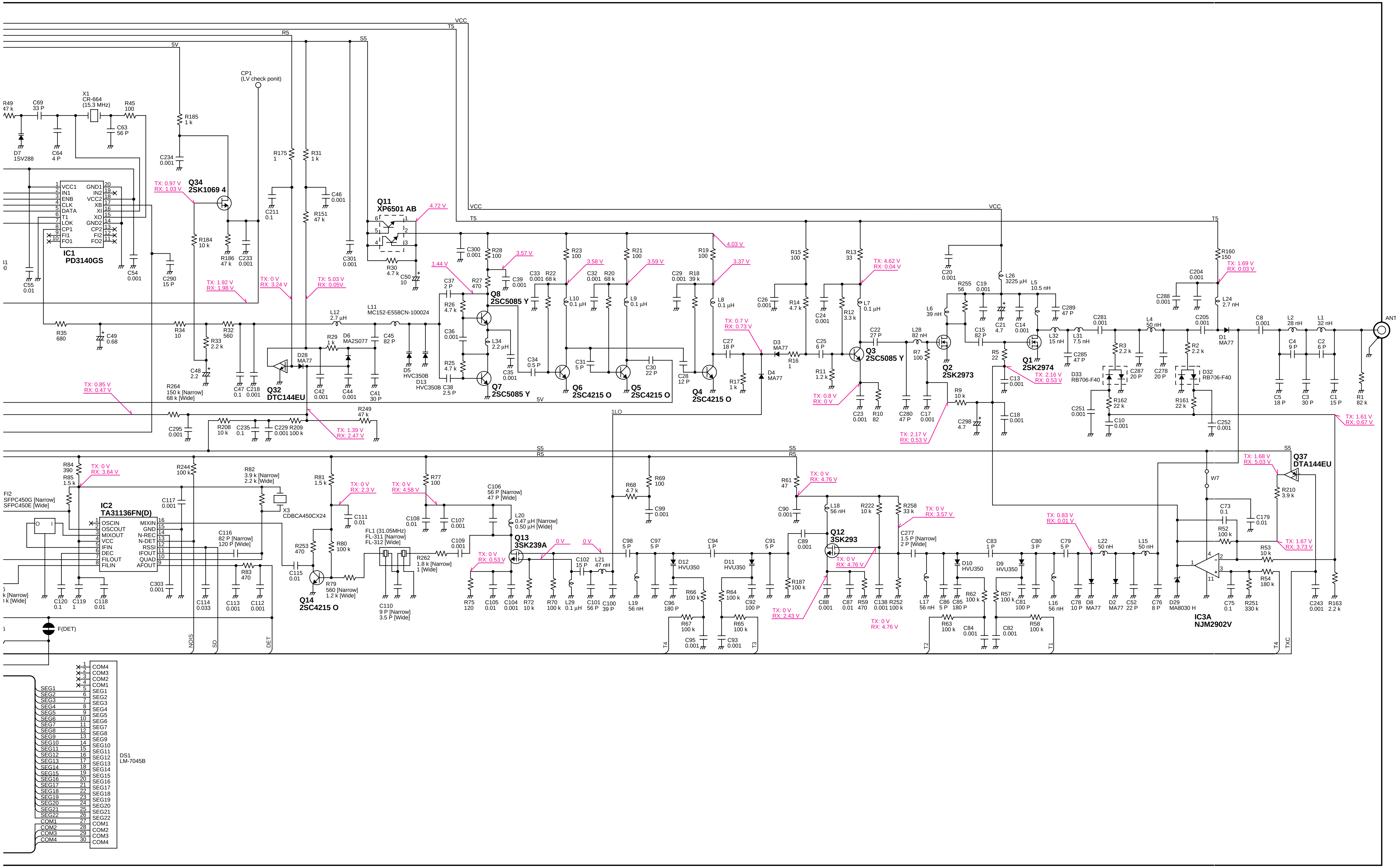


SECTION 11 VOLTAGE DIAGRAM




COMPLETE VIEW



COMPLETE VIEW

SECTION 11 VOLTAGE DIAGRAM



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